

**THE GOVERNMENT OF THE VIRGIN ISLANDS OF
THE UNITED STATES**



**RFP-020-2017 (P)
Manufacture and Delivery of Five (5)
Heavy-Duty Transit Buses**

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SECTION 1: NOTICE OF REQUEST FOR PROPOSALS UNITED STATES VIRGIN ISLANDS

NR 1. Description of the Work to be Done

The Government of the Virgin Islands (GVI) request Proposals for the manufacture and delivery of five (5) heavy duty buses with an option to purchase up to ten (10) additional vehicles for up to five years. The purchases will include associated spare parts, special tools and equipment, manuals and training. The purchases of the heavy duty buses will support the Department of Public Works VITRAN's fixed route public transit service program.

Specifically, GVI is requesting five (5) heavy-duty buses with right-hand drive and two (2) doors on the left side. The buses shall be no wider than 96 inches and overall body length shall be from 29 to 32 feet. Complete technical specifications are provided in the RFP.

The Contract shall be a firm fixed-price Contract.

NR 2. Proposal Due Date and Submittal Requirements

Proposals must be received by **Tuesday, August 22, 2017.**

1. All interested parties shall submit six (6) sets of proposals marked "Original," and THREE CDs, each containing an electronic PDF copy of the Proposal, which are to be delivered to the Department of Property and Procurement during hours of 8:00 a.m. to 5:00 p.m. Monday thru Friday except on holidays.
2. Sealed Proposals shall be submitted to the following address:

Lloyd Bough, Jr.
Commissioner Designee
Department of Property and Procurement
8201 Subbase, 3rd Floor
St. Thomas, Virgin Islands 00802

3. **THE SEALED ENVELOPE CONTAINING THE PROPOSAL MUST HAVE THE FOLLOWING INFORMATION WRITTEN ON THE OUTSIDE OF THE ENVELOPE OR PACKAGE:**

<p>SEALED PROPOSALS-DO NOT OPEN <u>RFP-020-2017 (P)</u> VITRAN HEAVY-DUTY BUSES (Name of Bidder) (Mailing Address of Bidder) (Telephone Number of Bidder) (E-Mail Address of Bidder) (Fax Number of Bidder)</p>
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The Virgin Islands of the United States
Five (5) 29 to 32-Foot Heavy-Duty Transit Bus
Section 3, General Conditions

4. Proposers are requested to submit to the Department of Property and Procurement SIX (6) hard copies marked "Original," and **THREE** CDs, each containing an electronic PDF copy of the Proposal. In case of any discrepancies, the hard copy will be considered by the GVI in evaluating the Proposal. The electronic version is provided for the GVI's administrative convenience only. A Proposal is deemed to be late if it is received by the Department of Property and Procurement after the deadline stated above. Proposals received after the submission deadline may be rejected.

NR 3. Validity of Proposals

Proposals and subsequent offers shall be valid for a period of 180 days.

NR 4. Pre-Proposal Meeting Information [Optional]

A Pre-Proposal Meeting will be held on **Tuesday, July 11, 2017**. The meeting will convene at **10:30a.m. Eastern Standard Time (EST)** in the Department of Property and Procurement conference room, located at 8201 Subbase, 3rd Floor, St. Thomas, Virgin Islands 00802. Prospective Proposers are requested to submit written questions to the Contracting Officer identified below, in advance of the Pre-Proposal Meeting. In addition, questions may be forwarded to Ms. Dazarene Lescott at dazarene.lescott@dpp.vi.gov and submitted up to the date specified in "Proposed Schedule for the Procurement." Responses will be shared with all prospective proposers. Prospective Proposers are reminded that any changes to the RFP will be by written addenda only, and nothing stated at the Pre-Proposal Meeting shall change or qualify in any way any of the provisions in the RFP and shall not be binding on the GVI.

Contracting Officer's Contact Information:

Name: Lloyd T. Bough Jr.
Title: Commissioner Designee
Department of Property and Procurement

Address: **The Department of Property and Procurement**
8201 Subbase, 3rd Floor
St. Thomas United States Virgin Islands 00802

Phone number: (340) 774-0828
Fax number: (340) 777-9587

Identification of Source of Funding

Financial support of this project is provided through financial assistance grants from the Federal Transit Administration (FTA), to the Government of the United States Virgin Islands, Department of Public Works. The procurement process is being guided by federal and local procurement laws, rules and regulations.

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The Virgin Islands of the United States
Five (5) 29 to 32-Foot Heavy-Duty Transit Bus
Section 3, General Conditions

Documents may be obtained from:

The Department of Property and Procurement
Division of Procurement
8201 Subbas, 3rd Floor
St. Thomas United States Virgin Islands 00802

Signed and Dated for Posting

Lloyd T. Bough Jr.
Commissioner Designee
Department of Property and Procurement

SECTION 2: INSTRUCTIONS TO PROPOSERS

IP 1. Quantities

The Work under these Contract documents consists of the manufacture and delivery of a base order of ten heavy duty buses along with associated spare parts, special tools and equipment, manuals and training on the operation and maintenance of the buses. The Proposer is also required to agree to grant the Government of the Virgin Islands the option for up to five years to purchase five (5) additional vehicles and spare parts.

IP 2. Proposed Schedule for the Procurement

The following is the solicitation schedule for proposers:

- Pre-Proposal Meeting/teleconference: Tuesday, July 11, 2017 at 10:30a.m.
- Proposer communications and requests deadline: Tuesday, July 25, 2017 at 4:00p.m.
- Proposal Due Date: Tuesday, August 22, 2017 at 4:00p.m.

IP 3. Obtaining Proposal Documents

Proposal documents may be obtained by contacting Latisha Blyden

The Department of Property and Procurement
Division of Procurement
8201 Subbase, 3rd Floor
Sub-base, St. Thomas United States Virgin Islands 00802
(340) 774-0828 ext 230

IP 4. Proposal Security Requirements (Reserved)

None

IP 5. Pre-Bid Meeting/Information for Proposers

A Pre-Proposal Meeting will be held on Tuesday, July 11, 2017 at 10:30a.m. The meeting will convene at 10:30 EST in the Department and Property and Procurement conference room, located at 8201 Subbase, 3rd Floor St. Thomas, U.S.V.I. Prospective Proposers are urged to make every effort to attend this meeting.

Prospective Proposers are requested to submit written questions to Ms. Dazarene Lescott at dazarene.lescott@dpp.vi.gov in advance of the Pre-Bid Meeting. In addition, questions may be submitted up to the date specified in "Proposed Schedule for the Procurement." Responses will be shared with all prospective Proposers. Prospective Proposers are reminded that any changes to the RFP will be by written addenda only, and nothing stated at the Pre-Bid Meeting shall change or qualify in any way any of the provisions in the RFP and shall not be binding on the GVI.

IP 6. Questions

IP 7. , Clarifications and Omissions

All correspondence, communication and contact in regard to any aspect of this solicitation or offers shall be only with the Contracting Officer identified above. Unless otherwise instructed by the Contracting Officer, proposers and their representatives shall not make any contact with or communicate with any member of the GVI, or its employees and consultants, other than the designated Contracting Officer, in regard to any aspect of this solicitation or offers.

At any time during this procurement up to the time specified in “Proposed Schedule for the Procurement,” Proposers may request, in writing, a clarification or interpretation of any aspect, a change to any requirement of the RFP, or any addenda to the RFP. Requests may include suggested substitutes for specified items and for any brand names, which whenever used in this solicitation shall mean the brand name or approved equal. Such written requests shall be made to the Contracting Officer. The Proposer making the request shall be responsible for its proper delivery to the Department of Property and Procurement as identified on the form Request for Pre-Offer Change or Approved Equal. Any request for a change to any requirement of the Contract documents must be fully supported with technical data, test results or other pertinent information showing evidence that the exception will result in a condition equal to or better than that required by the RFP, without a substantial increase in cost or time requirements.

All responses to Request for Pre-Offer Change or Approved Equal shall be provided to all proposers. Any response that is not confirmed by a written addendum shall not be official or binding on the GVI.

If it should appear to a Prospective Proposer that the performance of the Work under the Contract, or any of the matters relating thereto, is not sufficiently described or explained in the RFP or Contract documents, or that any conflict or discrepancy exists between different parts of the Contract or with any federal, state, local or GVI law, ordinance, rule, regulation or other standard or requirement, then the proposer shall submit a written request for clarification to the Department of Property and Procurement within the time period specified above.

IP 8. Addenda to RFP

The GVI reserves the right to amend the RFP at any time in accordance with “Proposed Schedule for the Procurement.” Any amendments to the RFP shall be described in written addenda. Notification of or the addenda also will be distributed to all such Prospective Proposers officially known to have received the RFP. Failure of any Prospective Proposer to receive the notification or addenda shall not relieve the Proposer from any obligation under the RFP therein. All addenda issued shall become part of the RFP. Prospective Proposers shall acknowledge the receipt of each individual addendum in their Proposals on the form Acknowledgement of Addenda. Failure to acknowledge in the Proposal receipt of addenda may at the GVI’s sole option disqualify the Proposal.

If the GVI determines that the addenda may require significant changes in the preparation of Proposals, the deadline for submitting the Proposals may be postponed by the number of days that the GVI determines will allow Proposers sufficient time to revise their Proposals. Any new Due Date shall be included in the addenda.

IP 9. DBE Requirements for Transit Vehicle Manufacturers

Pursuant to Title 49, Code of Federal Regulations, Part 26.49, a Proposer, as a condition of being authorized to respond to this solicitation, must certify by completing the form DBE Approval

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Certification that it has on file with the Federal Transportation Administration (FTA) an approved or not disapproved annual disadvantaged business enterprise (DBE) subcontracting participation goal.

IP 10. Conditions, Exceptions, Reservations or Understandings

Proposers are cautioned to limit exceptions, conditions and limitations to the provisions of this RFP, as they may be determined to be so fundamental as to cause rejection of the Proposal for not responding to the requirements of the RFP.

Any and all Deviations must be explicitly, fully and separately stated in the Proposal by completing Form for Proposal Deviation, setting forth at a minimum the specific reasons for each Deviation so that it can be fully considered and, if appropriate, evaluated by the GVI. All Deviations shall be evaluated in accordance with the appropriate evaluation criteria and procedures and may result in the Proposer receiving a less favorable evaluation than without the Deviation.

Form for Proposal Deviation shall be included in the Technical package.

IP 11. Protest Procedures

All protests must be in writing, stating the name and address of protestor, a contact person, Contract number and title. Protests shall specify in detail the grounds of the protest and the facts supporting the protest.

IP 11.1 Address

All protests must be addressed as follows:

- GVI Contact: Lloyd T. Bough Jr., Commissioner Designee
- For special delivery or hand delivery: Department of Property and Procurement, located at 8201 Subbase, 3rd Floor, St. Thomas, U.S.V.I.
- For U.S. Mail: Department of Property and Procurement, located at Building 8201 Subbase, 3rd Floor, St. Thomas, U.S.V.I. 00802

Protests not properly addressed to the address shown above may not be considered by the GVI.

Copies of the GVI's protest procedures and the protest provisions of FTA Circular 4220.1F or its successor may be obtained from Ms. Latisha Blyden Deputy Commissioner for Property and Procurement, at the Department of Property and Procurement, 8201 Subbase, 3rd Floor, St. Thomas, Virgin Islands 00802, Telephone Number 340-774-0828. Proposals will be opened and a Notice of Award will be issued by the GVI in accordance with the GVI's protest procedures and the protest provisions of FTA Circular 4220.1F or its successor.

IP 11.2 Pre-Proposal Protests

None

IP 11.3 Protests on the Recommended Award

All Proposers will be notified of the recommended award. This notice will be transmitted to each Proposer at the address contained in its Proposal form in a manner that provides verification of receipt. Any Proposer whose Proposal has not lapsed may protest the recommended award. Three (3) copies of a full and complete written statement specifying in detail the grounds of the protest and the facts supporting

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the protest must be received by the GVI at the appropriate address in “Address,” above, no later than fifteen (15) calendar days after the date such notification is received. Prior to the issuing of the Notice of Award, a written decision stating the grounds for allowing or denying the protest will be transmitted to the protestor and the Proposer recommended for award in a manner that provides verification of receipt.

IP 11.4 FTA Review

After such administrative remedies have been exhausted, an interested party may file a protest with the FTA pursuant to the procedures provided in the FTA C 4220.1F or its successor. FTA review is limited to the alleged failure of the GVI to have written protest procedures, the alleged failure of the GVI to follow those procedures, the alleged failure of the GVI to review a protest or the alleged violation of federal law or regulation.

IP 12. Preparation of Proposals

IP 12.1 Use of Proposal Forms

Proposers are advised that the forms contained in this RFP are required to be used for submission of a Proposal.

IP 12.2 Alternate and Multiple Proposals (Reserved)

IP 12.3 Proposal Format Requirements

Proposals shall be submitted in four (4) separately sealed packages identified below. Each package shall be marked as specified below and shall contain all of the Proposal documents for which the package is required to be marked and shall include no other documents. These same requirements shall apply to any best and final offers (BAFOs) that may be requested.

Package 1: Technical Proposal Requirements

NOTE: (See Section 6, Technical Proposal)

Letter of Transmittal

1. Technical Proposal
2. Acknowledgement of Addenda
3. Contractor Service and Parts Support Data
4. Form for Proposal Deviation (without price data)
5. Vehicle Questionnaire
6. References and Non-Priced Information
7. Engineering organization chart, engineering change control procedure, field modification process
8. Manufacturing facilities plant layout, other contracts, staffing
9. Production and delivery schedule and other Contract commitments for the duration of this Contract
10. Management Plan

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Package 2: Price Proposal Requirements

Each Price Proposal shall be on the prescribed Proposal form(s) and shall be for the entire Contract, including all Proposal items.

1. Letter of Transmittal
2. Pricing Schedule, (including but not limited to such pricing elements as option buses, spare parts package, manuals, training, special tools and test equipment)
3. The Price Proposal, SIX (6) copy sets, must be submitted in a separate sealed envelope.

The Proposer is required to complete and execute the GVI's Pricing Schedule, contained as part of the Proposal documents, and provide same in the Price Proposal. The Contractor shall be liable for payment of all local taxes applicable to the complete bus as delivered and should add these amounts to the Proposal price.

Package 3: Qualification Package Requirements

1. Pre-Award Evaluation Data Form
2. A copy of the three (3) most recent financial statements audited by an independent third party or a statement from the Proposer regarding how financial information may be reviewed by the GVI
3. Letter for insurance, indicating the Contractor's ability to obtain the insurance coverage in accordance with the RFP requirements
4. Letter from a surety for a Performance Guarantee, if required, indicating the Contractor's ability to obtain financial guarantees in accordance with the RFP requirements.
5. Form for Proposal Deviation, if applicable (without price data)
6. Proposal Form
7. All federal certifications: Buy America Certification, Debarment and Suspension Certification for Prospective Contractor, Debarment and Suspension Certification (Lower-Tier Covered Transaction), Non-Collusion Affidavit, Lobbying Certification, Certificate of Compliance with Bus Testing Requirement, DBE Approval Certification, and Federal Motor Vehicle Safety Standards.

NOTE: In lieu of 4 above, the GVI may allow the submission of a Letter from Parent Company, indicating the willingness of the parent company to provide the financial guarantee upon award for a possible cost reduction. See also "Qualification requirements," below.

Package 4: Proprietary/Confidential Information Package Requirements

The Proposer is directed to collect and submit any information it deems to be proprietary or confidential in nature in a separate marked and sealed package. If there is no confidential information, then the Proposer should include a statement to that effect. Subject package shall be submitted in accordance with the terms and conditions governing the submittal of proposer's Proposal to this RFP. Blanket-type identification by designating whole pages or sections as containing proprietary information, trade secrets or confidential commercial and financial information will not ensure confidentiality. The specific proprietary information, trade secrets or confidential commercial and financial information must be clearly identified as such.

The Proposer is advised that the GVI is public and as such may be subject to certain state and/or local Public Records Act provisions regarding the release of information concerning this RFP. If a request is

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received by the GVI for the release of Proposer's propriety/confidential information, subject request will be referred to the Proposer for review and consideration. If Proposer chooses to declare the information proprietary/confidential and withhold it from release, it shall defend and hold harmless the GVI from any legal action arising from such a declaration.

IP 12.4 GVI Treatment of Proprietary/Confidential Information

Access to government records is governed by the laws of the United States Virgin Islands. Except as otherwise required to be disclosed by applicable laws of the United States Virgin Islands, the GVI will exempt from disclosure proprietary information identified in Package 4.

Upon a request for records from a third party regarding this Proposal, the GVI will notify the Proposer in writing. The Proposer must respond within ten (10) business days with the identification of any and all "proprietary, trade secret, or confidential commercial or financial" information. Failure to respond within the allowed period shall be deemed an approval to release. The proposer shall indemnify the GVI's defense costs associated with its refusal to produce such identified information; otherwise, the requested information may be released.

The GVI shall employ sound business practices no less diligent than those used for the GVI's own confidential information to protect the confidence of all licensed technology, software, documentation, drawings, schematics, manuals, data and other information and material provided by Proposers and the Contractor pursuant to the Contract that contain confidential commercial or financial information, trade secrets or proprietary information as defined in or pursuant to the laws of the United States Virgin Islands against disclosure of such information and material to third parties, except as permitted by the Contract. The Contractor shall be responsible for ensuring that confidential commercial or financial information, trade secrets or proprietary information — with such determinations to be made by the GVI in its sole discretion — bears appropriate notices relating to its confidential character.

IP 12.5 Signing of Proposal Forms

Proposals shall include firm name (and, in the event that the Proposer is a joint venture, the names of the individual firms comprising the joint venture); business address; and the name, title and business address of the responsible individual(s) with their telephone, facsimile (fax) numbers and email address who may be contacted during the Proposal evaluation period for scheduling oral presentations and for receiving notices from the GVI. The proposer shall submit with their Proposal a copy of the joint venture agreement.

Proposals shall be signed by those individual(s) authorized to bind the proposer. The proposer shall submit evidence of the official's authority to act for and bind the Proposer in all matters relating to the Proposal. (In the event the Proposer is a joint venture or consortium, a representative of each of the members of the joint venture or consortium shall execute the Proposal. Each joint venture or consortium member is jointly and severally liable for the joint venture or consortium.)

IP 12.6 Modification or Withdrawal of Proposals

A modification of a Proposal already received will be accepted by the GVI only if the modification is received prior to the Proposal Due Date, or is made with a requested BAFO. All modifications shall be made in writing and executed and submitted in the same form and manner as the original Proposal.

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A Proposer may withdraw a Proposal already received prior to the Proposal Due Date by submitting to the GVI in the same manner as the original Proposal, a written request for withdrawal executed by the Proposer's authorized representative.

IP 12.7 Cost of Proposal Development

This RFP does not commit the GVI to enter into a Contract, to pay any costs incurred in the preparation or presentation of a Proposal, nor to procure or contract for the equipment.

IP 13. Proposal Evaluation, Negotiation and Selection

Proposals will be evaluated, negotiated, selected and any award made in accordance with the criteria and procedures described below. The approach and procedures are those that are applicable to a competitive negotiated procurement whereby Proposals are evaluated to determine which Proposals are within a Competitive Range. Discussions and negotiations may then be carried out with Proposers within the Competitive Range, after which BAFOs may be requested.

However, the GVI may select a Proposal for award without any discussions or negotiations or request for any BAFOs. Subject to the GVI's right to reject any or all Proposals, the Proposer whose Proposal is found to be most advantageous to the GVI will be selected, based upon consideration of the criteria of "Proposal Selection Process," below.

IP 13.1 Confidentiality of Proposals

Proposals will not be publicly opened. All Proposals and evaluations will be kept strictly confidential throughout the evaluation, negotiation and selection process, except as otherwise required by applicable law. Only the members of the Selection Committee and Evaluation Team and other GVI officials, employees and agents having a legitimate interest will be provided access to the Proposals and evaluation results during this period.

IP 13.2 Duration of the Validity of Proposals

Proposals and subsequent offers shall be valid for the period stated in "Section 1: Notice of Request for Proposals." The GVI may request Proposers to extend the period of time specified herein by written agreement between the GVI and the Proposer(s) concerned.

IP 13.3 Evaluation Committee

An Evaluation Committee, which will include officers, employees and agents of the GVI, will be established. The Evaluation Committee will carry out the detailed evaluations, including establishing the Competitive Range, carrying out negotiations and making the selection of the Proposer, if any, that may be awarded the Contract.

The Evaluation Committee may report its recommendations and findings to the appropriate GVI individual or body responsible for awarding the Contract.

IP 13.4 Proposal Selection Process

The following describes the process by which Proposals will be evaluated and a selection made for a potential award. Any such selection of a Proposal shall be made by consideration of only the criteria set forth below.

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“Qualification Requirements” specifies the requirements for determining responsible Proposers, all of which must be met by a Proposer to be found qualified. Final determination of a Proposer’s qualification will be made based upon all information received during the evaluation process and as a condition for award.

“Proposal Evaluation Criteria” contains all the evaluation criteria, and their relative order of importance, by which a Proposal from a qualified Proposer will be considered for selection. An award, if made, will be to a responsible Proposer for a Proposal that is found to be in the GVI’s best interests, based on price and other evaluation criteria considered. The procedures to be followed for these evaluations are provided in “Evaluation Procedures,” below.

Qualification Requirements

The following are the requirements for qualifying responsible proposers. All of these requirements should be met; therefore, they are not listed by any particular order of importance. Any Proposal that the Evaluation Committee finds not to meet these requirements, and cannot be made to meet these requirements, may be determined by the Evaluation Committee not to be responsible and the Proposal rejected. The requirements are as follows:

1. Sufficient financial strength, resources and capability to finance the Work to be performed and to complete the Contract in a satisfactory manner, as measured by the following:
 - Proposer’s financial statements prepared in accordance with generally accepted accounting principles of the jurisdiction in which the proposer is located, and audited by an independent certified public accountant; or a statement from the Proposer regarding how financial information may be reviewed by the GVI.
 - Proposer’s ability to secure financial guarantees, if required, as evidenced by a letter of commitment from an underwriter, surety or other guarantor confirming that the Proposer can provide the required guarantee.
 - Proposer’s ability to obtain required insurance with coverage values that meet minimum requirements evidenced by a letter from an underwriter confirming that the proposer can be insured for the required amount.
2. Evidence that the human and physical resources are sufficient to perform the Contract as specified and to ensure delivery of all equipment within the time specified in the Contract, to include the following:
 - Engineering, management and service organizations with sufficient personnel and requisite disciplines, licenses, skills, experience and equipment to complete the Contract as required and to satisfy any engineering or service problems that may arise during the warranty period.
 - Adequate manufacturing facilities sufficient to produce and factory-test equipment on schedule.
 - A spare parts procurement and distribution system sufficient to support equipment maintenance without delays and a service organization with skills, experience and equipment sufficient to perform all warranty and on-site Work.
3. Evidence that proposer is qualified in accordance with the provisions of “Section 8: Quality Assurance.”
4. Evidence of satisfactory performance and integrity on contracts in making deliveries on time, meeting specifications and warranty provisions, parts availability and steps Proposer took to

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resolve any judgments, liens, Fleet Defects history or warranty claims. Evidence shall be by client references.

5.

Proposal Evaluation Criteria

The following are the complete criteria, listed by their relative degree of importance, by which Proposals from responsible Proposers will be evaluated and ranked for the purposes of determining any Competitive Range and to make any selection of a Proposal for a potential award. Any exceptions, conditions, reservations or understandings explicitly, fully and separately stated on Form for Proposal Deviation, which do not cause the GVI to consider a Proposal to be outside the Competitive Range, will be evaluated according to the respective evaluation criteria and sub-criteria that they affect.

EVALUATION CRITERIA

A. Evaluation/Selection Committee

An Evaluation Committee (Committee) will review and screen the Proposals submitted according to the **pre-established criteria as set forth below**.

B. Pre-Proposal Meeting

Attendance at the Pre-Proposal Meeting is **preferred** but not mandatory.

C. Technical Evaluation Criteria (maximum of 70 points)

Proposals will be evaluated using the following principal selection criteria:

- 1. Product design and performance (0-30 points):** The information provided by the Proposer in its technical submittal relating to the buses to be provided will be utilized to evaluate the Proposal in relation to specifications provided in the RFP. Vehicle construction and system design, as well as documented reliability, may be used in this evaluation, as well as other design and performance elements of the components that comprise those systems. At a minimum, test results, safety and maintenance factors, and cost of normal operation for the bus design and system components proposed, may be considered in determining a final value for this factor.
- 2. Proposer's reputation and performance (0-20 points):** The Committee will consider the capability and reputation of the Proposer as presented in the Proposal or as is determined by review of information available from references or other resources. The evaluation may look at the Proposer's overall organizational and financial capabilities and consider key components such as organizational reporting structure, quality control, quality assurance, research and development, technical, training and parts support, response time, product capabilities, ability to furnish multiple bus configurations, bonding capacity, and financial history, as well as other considerations, in reaching a final point determination. The committee may also look at judgments, liens, Fleet Defect history, warranty claims and the steps that the manufacturer took to resolve these concerns in assessing the overall reputation of the manufacturer.
- 3. Delivery schedule (0-20 points):** The Committee will review the proposed delivery schedule for the Agency's minimum purchase of buses. Delivery schedules that fulfill the delivery requirements, with evidence that the schedule can be accomplished, may receive higher points for this category.

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D. Cost Proposal Evaluation (maximum of 30 points)

As described below, the proposed cost as submitted by the Proposer will be assigned a maximum of 30 points.

The cost will be evaluated in the following manner:

1. Cost Proposal Criteria (0-30 points)

- a. The Cost Proposal criteria will be based on the “Total Sum of Total Base Offer per Bus.”
- b. The lowest average Cost Proposal will receive 20 points. Every other Proposal previously found to be in the Competitive Range will be given points proportionately in relation to the lowest price.

E. Evaluation Methodology

The maximum number of points achievable in each of the aforementioned areas is as follows:

- **Attendance at Pre-Proposal Meeting:** 0 points
- **Product design and performance:** 0-30 points
- **Manufacturer’s reputation and performance:** 0-20 points
- **Delivery schedule:** 0-20 points
- **Cost proposal:** 0-30 points

TOTAL POSSIBLE POINTS: 100

IP 13.5 Evaluation Procedures

Proposals will be analyzed for conformance with the instructions and requirements of the RFP and Contract documents. Proposals that do not comply with these instructions and do not include the required information may be rejected as insufficient or not be considered for the Competitive Range. The GVI reserves the right to request that a Proposer provide any missing information and make corrections. Proposers are advised that the detailed evaluation forms and procedures will follow the same Proposal format and organization specified in “Preparation of Proposals.” Therefore, Proposers should pay close attention to and strictly follow all instructions. Submittal of a Proposal will signify that the Proposer has accepted the whole of the Contract documents, except such conditions, exceptions, reservations or understandings explicitly, fully and separately stated on the forms and according to the instructions of Form for Proposal Deviation. Any such conditions, exceptions, reservations or understandings that do not result in the rejection of the Proposal are subject to evaluation under the criteria set forth in “Proposal Selection Process.”

Evaluations will be made in strict accordance with all of the evaluation criteria specified in “Proposal Selection Process,” above. The GVI will choose the Proposal that it finds to be most advantageous to the Agency, based upon the evaluation criteria.

IP 13.6 Evaluations of Competitive Proposals

1. **Qualification of responsible Proposers.** Proposals will be evaluated to determine the responsibility of proposers. A final determination of a Proposer’s responsibility will be made upon the basis of initial information submitted in the Proposal, any information submitted upon request by the GVI, information submitted in a BAFO and information resulting from GVI inquiry of Proposer’s references and its own knowledge of the Proposer.

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2. **Detailed evaluation of Proposals and determination of Competitive Range.** The GVI will carry out and document its evaluations in accordance with the criteria and procedures set forth in “Proposal Selection Process.” Any Proposal deficiencies that may render a Proposal unacceptable will be documented. The GVI will make specific note of questions, issues, concerns and areas requiring clarification by Proposers and to be discussed in any meetings with Proposers that the GVI finds to be within the Competitive Range.

Rankings of the Proposals against the evaluation will then be made for determining which Proposals are within the Competitive Range, or may reasonably be made to be within the Competitive Range.

3. **Proposals not within the Competitive Range.** Proposers of any Proposals that have been determined by the GVI as not in the Competitive Range, and that cannot be reasonably made to be within the Competitive Range, will be notified in accordance with the GVI’s policies.
4. **Discussions with Proposers in the Competitive Range.** The Proposers whose Proposals are found by the GVI to be within the Competitive Range, or that may be reasonably made to be within the Competitive Range, will be notified and any questions or requests for clarifications provided to them in writing. Each such Proposer may be invited for an interview and discussions with the GVI to discuss answers to written or oral questions, clarifications and any facet of its Proposal.

In the event that a Proposal that has been included in the Competitive Range contains conditions, exceptions, reservations or understandings to any Contract requirements as provided in Form for Proposal Deviation, said conditions, exceptions, reservations or understandings may be negotiated during these meetings. However, the GVI shall have the right to reject any and all such conditions and exceptions, and instruct the Proposer to amend its Proposal and remove said conditions and exceptions; and any Proposer failing to do so may cause the GVI to find such Proposal to be outside the Competitive Range.

No information, financial or otherwise, will be provided to any Proposer about any of the Proposals from other Proposers, to the extent permitted by applicable law. Proposers will not be given a specific price or specific financial requirements they must meet to gain further consideration, except that proposed prices may be considered to be too high with respect to the marketplace or unacceptable. Proposers will not be told of their rankings among the other Proposers prior to Contract award.

5. **Factory and site visits.** The GVI reserves the right to conduct factory visits of the Proposer’s facilities and/or the facilities of major sub-suppliers included in the Proposal.
6. **Best and final offers.** After all interviews have been completed, the Proposers in the Competitive Range may be afforded the opportunity to amend their Proposals and make their BAFOs.
7. **Debriefing.** Subsequent to the award, the unsuccessful Proposers will be notified and may request a debriefing. Proposers will be debriefed in accordance with GVI policies, including information regarding the shortcomings of their Proposal.

IP 14. Response to Proposals

IP 14.1 Single Proposal Response

If only one Proposal is received in response to this RFP and it is found by the GVI to be acceptable, a price or cost analysis, or both, possibly including an audit, may be performed by or for the GVI. The Proposer has agreed to such analysis by submitting a Proposal in response to this RFP.

IP 14.2 Availability of Funds

This procurement is subject to the availability of funding. This procurement is being funded by the FTA.

The GVI reserves the right to cancel the procurement in whole or in part, at its sole discretion, at any time before the Contract is fully executed and approved on behalf of the GVI.

The GVI reserves the right to reject any or all Proposals, to undertake discussions with one or more Proposers, and to accept that Proposal or modified Proposal which, in its judgment, will be most advantageous to the GVI, considering price and other evaluation criteria. The GVI reserves the right to determine any specific Proposal that is conditional or not prepared in accordance with the instructions and requirements of this RFP to be nonresponsive. The GVI reserves the right to waive any Defects, or minor informalities or irregularities in any Proposal which do not materially affect the Proposal or prejudice other Proposers.

If there is any evidence indicating that two or more proposers are in collusion to restrict competition or are otherwise engaged in anti-competitive practices, the Proposals of all such Proposers shall be rejected, and such evidence may be a cause for disqualification of the participants in any future solicitations undertaken by the GVI.

The GVI may reject a Proposal that includes unacceptable Deviations as provided in Form for Proposal Deviation.

IP 14.3 Agency Contract Approval Process (Reserved)

GVI Rights

The GVI reserves the right to cancel the procurement in whole or in part, at its sole discretion, at any time before the Contract is fully executed and approved on behalf of the GVI.

The GVI reserves the right to reject any or all Proposals, to undertake discussions with one or more Proposers, and to accept that Proposal or modified Proposal which, in its judgment, will be most advantageous to the GVI, considering price and other evaluation criteria. The GVI reserves the right to determine any specific Proposal that is conditional or not prepared in accordance with the instructions and requirements of this RFP to be nonresponsive. The GVI reserves the right to waive any Defects, or minor informalities or irregularities in any Proposal which do not materially affect the Proposal or prejudice other Proposers.

If there is any evidence indicating that two or more proposers are in collusion to restrict competition or are otherwise engaged in anti-competitive practices, the Proposals of all such Proposers shall be rejected, and such evidence may be a cause for disqualification of the participants in any future solicitations undertaken by the GVI.

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The GVI may reject a Proposal that includes unacceptable Deviations as provided in Form for Proposal Deviation.

IP 14.4 Execution of Contract

The acceptance of a Proposal for award, if made, shall be evidenced in writing by a notice of award of Contract delivered to the Proposer whose Proposal is accepted. Upon notice of award of the Contract to a Proposer, the Proposer shall commence performance under the Contract by furnishing any required bonds, and by furnishing copies of the certificates of insurance required to be procured by the Contractor pursuant to the Contract documents.

IP 15. Conflicts of Interests and Gratuities

Proposers are prohibited from engaging in any practice that may be considered as a conflict of interests under existing GVI policies and/or Territorial law, and to refrain from participating in any gifts, favors or other forms of compensation that may be viewed as a gratuity in accordance with existing policies and laws.

IP 16. Government of the Virgin Islands – Specific Provisions

(Reserved)

SECTION 3: GENERAL CONDITIONS

GC 1. Definitions

The following are definitions of special terms used in this document:

Agency: Government of the Virgin Islands (GVI)

Authorized Signer: The person who is executing this Contract on behalf of the Contractor and who is authorized to bind the Contractor.

Best And Final Offer (BAFO): The last Proposal made by a Proposer. If a BAFO is not specifically requested by the GVI, or if the Proposer does not promptly respond to a request for BAFO, then the most recent, current Proposal is the BAFO.

Class 1 Failure (physical safety): A failure that could lead directly to passenger or operator injury and represents a severe crash situation.

Class 2 Failure (road call): A failure resulting in an en route interruption of revenue service. Service is discontinued until the bus is replaced or repaired at the point of failure.

Competitive Range: The range of proposals that are identified as the most highly rated, unless the range is further reduced for purposes of efficiency.

Contract: The Proposal and its acceptance by the GVI as manifested by the Contract documents specified in “Section 10: Contract.”

Contracting Officer: The person who is executing this Contract on behalf of the GVI and who has complete and final authority except as limited herein.

Contractor: The successful Proposer who is awarded a Contract for providing all buses and equipment described in the Contract documents.

Days: Unless otherwise stated, “days” shall mean calendar days.

Defect: Patent or latent malfunction or failure in manufacture, installation or design of any component or subsystem.

Deviation: Variance from a requirement or specification that does not alter the basis of a contract or adversely affects its performance.

Due Date: The date and time by which Proposals must be received by the GVI as specified in “Section 1: Notice of Request for Proposals.”

Extended Warranty: A warranty available for purchase above the standard warranty.

Fatigue Failure (Corrosion Fatigue): The mechanical degradation of a material under the joint action of corrosion and cyclic loading.

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Pass-Through Warranty: A warranty provided by the Contractor but administered directly with the component Supplier.

Proposal: A promise, if accepted, to deliver equipment and services according to the underlying solicitation of the GVI document using the prescribed form in the solicitation, including any Proposal or BAFO.

Proposer: A legal entity that makes a Proposal.

Related Defect: Damage inflicted on any component or subsystem as a direct result of a separate Defect.

Solicitation: Agency's request for proposals.

Superior Warranty: A warranty still in effect after all contractually required warranties have expired. The remaining warranty is administered directly between the sub-Supplier and the GVI.

Supplier: Any manufacturer, company providing units, components or subassemblies for inclusion in the bus that are installed by the Contractor. Supplier items shall require qualification by type and acceptance tests in accordance with requirements defined in "Section 8: Quality Assurance."

Subcontractor: Any manufacturer, company providing units, components or subassemblies for inclusion in the bus that are installed by a Subcontractor. Subcontractor items shall require qualification by type and acceptance tests in accordance with requirements defined in "Section 8: Quality Assurance."

Work: Any and all labor, supervision, services, materials, machinery, equipment, tools, supplies and facilities called for by the Contract and necessary to the completion thereof.

GC 2. Materials and Workmanship

The Contractor shall be responsible for all materials and workmanship in the construction of the bus and all accessories used, whether the same are manufactured or conducted by the Contractor or purchased from a Supplier or completed by a Subcontractor. This provision excludes any equipment leased or supplied by the GVI, except insofar as such equipment is damaged by the failure of a part or component for which the Contractor is responsible, or except insofar as the damage to such equipment is caused by the Contractor during the manufacture of the buses.

GC 3. Conformance with Specifications and Drawings

Materials furnished and Work performed by the Contractor shall conform to the requirements of the Technical Specifications and other Contract documents. Notwithstanding the provision of drawings, technical specifications or other data by the GVI, the Contractor shall have the responsibility of supplying all parts and details required to make the bus complete and ready for service even though such details may not be specifically mentioned in the drawings and specifications. Items that are installed by the GVI shall not be the responsibility of the Contractor unless they are included in this Contract.

GC 4. Inspection, Testing and Acceptance

GC 4.1 General

The pre-delivery tests and inspections shall be performed at the Contractor's plant; they shall be performed in accordance with the procedures defined in "Section 8: Quality Assurance"; and they may be witnessed by the resident inspector. When a bus passes these tests and inspections, the resident inspector shall authorize release of the bus.

Within twenty-five (25) calendar days after arrival at the designated point of delivery, the bus shall undergo the GVI tests defined in "Post-Delivery Tests." If the bus passes these tests or if the GVI does not notify the Contractor of non-acceptance within 25 calendar days after delivery, then acceptance of the bus by the GVI occurs on the 25th day after delivery. If the bus fails these tests, it shall not be accepted until the repair procedures defined in "Repairs After Non-acceptance" have been carried out and the bus retested until it passes. Acceptance occurs earlier if the GVI notifies the Contractor of early acceptance or places the bus in revenue service.

GC 4.2 Risk of Loss

The GVI shall assume risk of loss of the bus on delivery, as defined in "Bus Delivery." Prior to this delivery, the Contractor shall have risk of loss of the bus, including any damages sustained during the delivery regardless of the status of title or any payments related to the bus. Drivers shall keep a maintenance log en route, and it shall be delivered to the GVI with the bus. If the bus is released back to the Contractor for any reason, the Contractor has the risk of loss upon such release.

GC 5. Title and Warranty of Title

Adequate documents for registering the bus in the United States Virgin Islands shall be provided to the GVI not less than 10 business days before delivery to the GVI. Upon acceptance of each bus, the Contractor warrants that the title shall pass to the GVI free and clear of all encumbrances.

GC 6. Intellectual Property Warranty

The GVI shall advise the Contractor of any impending patent suit related to this Contract against the GVI and provide all information available. The Contractor shall defend any suit or proceeding brought against the GVI based on a claim that any equipment, or any part thereof, furnished under this Contract constitutes an infringement of any patent, and the Contractor shall pay all damages and costs awarded therein, excluding incidental and consequential damages, against the GVI. In case said equipment, or any part thereof, is in such suit held to constitute infringement and use of said equipment or parts is enjoined, the Contractor shall, at its own expense and at its option, either procure for the GVI the right to continue using said equipment or part, or replace same with non-infringing equipment, or modify it so it becomes non-infringing.

The Contractor's obligations under this section are discharged and the GVI shall hold the Contractor harmless with respect to the equipment or part if it was specified by the GVI and all requests for substitutes were rejected, and the Contractor advised the GVI under "Questions, Clarifications and Omissions" of a potential infringement, in which case the Contractor shall be held harmless.

GC 7. Data Rights

GC 7.1 Proprietary Rights/Rights in Data

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The term “subject data” used in this clause means recorded information, whether or not copyrighted, that is delivered or specified to be delivered under the Contract. It includes the proprietary rights of the following:

- Shop drawings and working drawings
- Technical data including manuals or instruction materials, computer or microprocessor software
- Patented materials, equipment, devices or processes
- License requirements

The GVI shall protect proprietary information provided by the Contractor to the fullest extent of the law. The Contractor shall grant a non-exclusive license to allow the GVI to utilize such information in order to maintain the vehicles. In the event that the Contractor no longer provides the information the GVI has the right to reverse engineer patented parts and software.

The GVI reserves a royalty-free, non-exclusive and irrevocable license to reproduce, publish or otherwise use, and to authorize others to use, the following subject data for its purposes: (1) any subject data required to be developed and first produced in the performance of the Contract and specifically paid for as such under the Contract, whether or not a copyright has been obtained; and (2) any rights of copyright to which the Contractor, Subcontractor or Supplier purchases ownership for the purpose of performance of the Contract and specifically paid for as such under the Contract. The Contractor agrees to include the requirements of this clause, modified as necessary to identify the affected parties, in each subcontract and supply order placed under the Contract.

GC 7.2 Access to Onboard Operational Data

The GVI grants to the Contractor the right to inspect, examine, download, and otherwise obtain any information or data available from components provided by the Contractor, including, but not limited to, any electronic control modules or other data-collection devices, to the extent necessary to enable Contractor to perform reliability maintenance analysis, corrective action and/or other engineering type Work for the bus. This right expressly excludes access to information or data collected on any equipment not provided and installed by the Contractor.

GC 8. Changes

GC 8.1 Contractor Changes

Any proposed change in this Contract shall be submitted to the GVI for its prior approval. Oral change orders are not permitted. No change in this Contract shall be made without the prior written approval of the Contracting Officer. The Contractor shall be liable for all costs resulting from, and/or for satisfactorily correcting, any specification change not properly ordered by written modification to the Contract and signed by the Contracting Officer.

GC 8.2 Government of the Virgin Islands (GVI) Changes

The GVI may obtain changes to the Contract by notifying the Contractor in writing. As soon as reasonably possible but no later than thirty (30) calendar days after receipt of the written change order to modify the Contract, the Contractor shall submit to the Contracting Officer a detailed price and schedule Proposal for the Work to be performed. This Proposal shall be accepted or modified by negotiations between the Contractor and the Contracting Officer. At that time, a detailed modification shall be executed in writing by both parties. Disagreements that cannot be resolved within negotiations shall be

resolved in accordance with “Disputes,” below. Regardless of any disputes, the Contractor shall proceed with the Work ordered.

GC 9. Legal Clauses

GC 9.1 Indemnification

GC 9.1.1 The Contractor shall, to the extent permitted by law: (1) protect, indemnify and save the GVI and its officers, employees and agents, including consultants, harmless from and against any and all liabilities, damages, claims, demands, liens, encumbrances, judgments, awards, losses, costs, expenses and suits or actions or proceedings, including reasonable expenses, costs and attorneys’ fees incurred by the GVI and its officers, employees and agents, including consultants, in the defense, settlement or satisfaction thereof, for any injury, death, loss or damage to persons or property of any kind whatsoever, arising out of or resulting from the intentional misconduct or negligent acts, errors or omissions of the Contractor in the performance of the Contract, including intentional misconduct, negligent acts, errors or omissions of its officers, employees, servants, agents, Subcontractors and Suppliers; and (2) upon receipt of notice and if given authority, shall settle at its own expense or undertake at its own expense the defense of any such suit, action or proceeding, including appeals, against the GVI and its officers, employees and agents, including consultants, relating to such injury, death, loss or damage. Each party shall promptly notify the other in writing of the notice or assertion of such claim, demand, lien, encumbrance, judgment, award, suit, action or other proceeding hereunder. The Contractor shall have sole charge and direction of the defense of such suit, action or proceeding. The GVI shall not make any admission that might be materially prejudicial to the Contractor unless the Contractor has failed to take over the conduct of any negotiations or defense within a reasonable time after receipt of the notice and authority above provided. The GVI shall at the request of the Contractor furnish to the Contractor all reasonable assistance that may be necessary for the purpose of defending such suit, action or proceeding, and shall be repaid all reasonable costs incurred in doing so. The GVI shall have the right to be represented therein by advisory council of its own selection at its own expense.

GC 9.1.2 The obligations of the Contractor under the above paragraph shall not extend to circumstances where the injury, death or damages are caused solely by the negligent acts, errors or omissions of the GVI, its officers, employees, agents or consultants, including, without limitation, negligence in: (1) the preparation of the Contract documents, or (2) the giving of directions or instructions with respect to the requirements of the Contract by written order. The obligations of the Contractor shall not extend to circumstances where the injury, death or damages are caused, in whole or in part, by the negligence of any third-party operator, not including an assignee or Subcontractor of the Contractor, subject to the right of contribution. In case of joint or concurrent negligence of the parties giving rise to a claim or loss against either one or both, each shall have full rights of contribution from the other.

GC 9.2 Suspension of Work

GC 9.2.1. The GVI may at any time and for any reason within its sole discretion issue a written order to the Contractor suspending, delaying or interrupting all or any part of the Work for a specified period of time.

GC 9.2.2. The Contractor shall comply immediately with any such written order and take all reasonable steps to minimize costs allocable to the Work covered by the suspension during the period of work stoppage. Contractor shall continue the Work that is not included in the suspension and shall continue such ancillary activities as are not suspended. The Contractor shall resume performance of the suspended Work upon expiration of the notice of suspension, or upon direction from the GVI.

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GC 9.2.3. The Contractor shall be allowed an equitable adjustment in the Contract price (excluding profit) and/or an extension of the Contract time, to the extent that cost or delays are shown by the Contractor to be directly attributable to any suspension. However, no adjustment shall be made under this section for any suspension, delay or interruption due to the fault or negligence of the Contractor, or for which an equitable adjustment is provided for, or excluded under any other term or condition of the Contract. As soon as reasonably possible but no later than forty-five (45) calendar days, or any other period of time agreed to by the parties, after receipt of the written suspension of work notice, the Contractor shall submit to the Contracting Officer a detailed price and schedule Proposal for the suspension, delay or interruption.

GC 9.3 Excusable Delays/Force Majeure

GC 9.3.1. If the Contractor is delayed at any time during the progress of the Work by the neglect or failure of the GVI or by a cause as described below, then the time for completion and/or affected delivery date(s) shall be extended by the GVI subject to the following cumulative conditions:

- a. The cause of the delay arises after the Notice of Award and neither was nor could have been anticipated by the Contractor by reasonable investigation before such award. Such cause may also include force majeure events such as any event or circumstance beyond the reasonable control of the Contractor, including but not limited to acts of God; earthquake, flood and any other natural disaster; civil disturbance, strikes and labor disputes; fires and explosions; war and other hostilities; embargo; or failure of third parties, including Suppliers or Subcontractors, to perform their obligations to the Contractor;
- b. The Contractor demonstrates that the completion of the Work and/or any affected deliveries will be actually and necessarily delayed;
- c. The Contractor has taken measures to avoid and/or mitigate the delay by the exercise of all reasonable precautions, efforts and measures, whether before or after the occurrence of the cause of delay; and
- d. The Contractor makes written request and provides other information to the GVI as described in GC 9.3.4 below.

A delay in meeting all of the conditions of this section shall be deemed an excusable delay. Any concurrent delay that does not constitute an excusable delay shall not be the sole basis for denying a request hereunder.

GC 9.3.2. None of the above shall relieve the Contractor of any liability for the payment of any liquidated damages owing from a failure to complete the Work by the time for completion that the Contractor is required to pay pursuant to “Liquidated Damages for Late Delivery of the Bus” for delays occurring prior to, or subsequent to the occurrence of an excusable delay.

GC 9.3.3. The GVI reserves the right to rescind or shorten any extension previously granted, if subsequently the GVI determines that any information provided by Contractor in support of a request for an extension of time was erroneous; provided, however, that such information or facts, if known, would have resulted in a denial of the request for an excusable delay. Notwithstanding the above, the GVI will not rescind or shorten any extension previously granted if the Contractor acted in reliance upon the

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granting of such extension and such extension was based on information which, although later found to have been erroneous, was submitted in good faith by the Contractor.

GC 9.3.4. No extension or adjustment of time shall be granted unless: (1) written notice of the delay is filed with the GVI within fourteen (14) calendar days after the commencement of the delay and (2) a written application therefore, stating in reasonable detail the causes, the effect to date and the probable future effect on the performance of the Contractor under the Contract, and the portion or portions of the Work affected, is filed by the Contractor with the GVI within thirty (30) calendar days after the commencement of the delay. No such extension or adjustment shall be deemed a waiver of the rights of either party under this Contract. The GVI shall make its determination within thirty (30) calendar days after receipt of the application.

GC 9.4 Termination

GC 9.4.1. Termination for Convenience

The performance of Work under this Contract may be terminated by the GVI in accordance with this clause in whole, or from time to time in part, whenever the contracting officer shall determine that such termination is in the best interest of the GVI. Any such termination shall be effected by delivery to the Contractor of a notice of termination specifying the extent to which performance of Work under the Contract is terminated, and the date upon which such termination becomes effective.

After receipt of a notice of termination, and except as otherwise directed by the Contracting Officer, the Contractor shall do the following:

- Stop Work under the Contract on the date and to the extent specified in the notice of termination.
- Place no further orders or subcontracts for materials, services or facilities, except as may be necessary for completion of such portion of the Work under the Contract as is not terminated. Terminate all orders and subcontracts to the extent that they relate to the performance of work terminated by the notice of termination; assign to the Agency in the manner, at the times, and to the extent directed by the Contracting Officer, all of the right, title and interest of the Contractor under the orders and subcontracts so terminated, in which case the GVI shall have the right, in its discretion, to settle or pay any or all claims arising out of the termination of such orders and subcontracts.
- Settle all outstanding liabilities and all claims arising out of such termination of orders and subcontracts, with the approval or ratification of the Contracting Officer, to the extent he or she may require, which approval or ratification shall be final for all the purposes of this clause.
- Transfer title to the GVI and deliver in the manner, at the times and to the extent, if any, directed by the Contracting Officer the fabricated or un-fabricated parts, Work in process, completed Work, supplies and other material produced as part of, or acquired in connection with the performance of, the Work terminated, and the completed or partially completed plans, drawings, information and other property which, if the Contract had been completed, would have been required to be furnished to the GVI.
- Use its best efforts to sell, in the manner, at the times, to the extent, and at the price(s) directed or authorized by the Contracting Officer, any property of the types referred to above, provided, however, that the Contractor shall not be required to extend credit to any purchaser, and may acquire any such property under the conditions prescribed by and at a price(s) approved by the Contracting Officer, and provided further that the proceeds of any such transfer or disposition shall be applied in reduction of any payments to be made by the GVI to the Contractor under this

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Contract or shall otherwise be credited to the price or cost of the Work covered by this Contract or paid in such other manner as the Contracting Officer may direct.

- Complete performance of such part of the Work as shall not have been terminated by the notice of termination.
- Take such action as may be necessary, or as the Contracting Officer may direct, for the protection or preservation of the property related to this Contract that is in the possession of the Contractor and in which the GVI has or may acquire an interest.

The Contractor shall be paid its costs, including Contract close-out costs, and profit on Work performed up to the time of termination. The Contractor shall promptly submit its termination claim to GVI to be paid the Contractor. Settlement of claims by the Contractor under this termination for convenience clause shall be in accordance with the provisions set forth in Part 49 of the Federal Acquisition Regulations (48 CFR 49) except that wherever the word "Government" appears, it shall be deleted and the word "GVI" shall be substituted in lieu thereof.

GC 9.4.2. Termination for Default

The GVI may, by written notice of default to the Contractor, terminate the whole or any part of this Contract if the Contractor fails to make delivery of the supplies or to perform the services within the time specified herein or any extension thereof; or if the Contractor fails to perform any of the other material provisions of the Contract, or so fails to make progress as to endanger performance of this Contract in accordance with its terms, and in either of these two circumstances does not cure such failure within a period of ten (10) business days, or such longer period as the Contracting Officer may authorize in writing, after receipt of notice from the Contracting Officer specifying such failure.

If the Contract is terminated in whole or in part for default, the Agency may procure, upon such terms and in such manner as the Contracting Officer may deem appropriate, supplies or services similar to those so terminated. The Contractor shall be liable to the GVI for any excess costs for such similar supplies or services, and shall continue the performance of this Contract to the extent not terminated under the provisions of this clause.

Except with respect to defaults of Subcontractors, the Contractor shall not be liable for any excess costs if the failure to perform the Contract arises out of a cause beyond the control and without the fault or negligence of the Contractor. If the failure to perform is caused by the default of a Subcontractor, and if such default arises out of causes beyond the control of both the Contractor and Subcontractor, and without the fault or negligence of either of them, the Contractor shall not be liable for any excess costs for failure to perform, unless the supplies or services to be furnished by the Subcontractor were obtainable from other sources and in sufficient time to permit the Contractor to meet the required delivery schedule.

Payment for completed supplies delivered to and accepted by the GVI shall be at the Contract price. The GVI may withhold from amounts otherwise due the Contractor for such completed supplies such sum as the Contracting Officer determines to be necessary to protect the GVI against loss because of outstanding liens or claims of former lien holders.

If, after notice of termination of this Contract under the provisions of this clause, it is determined for any reason that the Contractor was not in default under the provisions of this clause, or that the default was excusable under the provisions of this clause, the rights and obligations of the parties shall be the same as if the notice of termination had been issued pursuant to termination for convenience of the GVI.

GC 9.5 Compliance with Laws and Regulations

Contractor shall at all times comply with all applicable laws, regulations, policies, procedures and directives (together, the “Law”), including without limitation, FTA regulations, policies, procedures and directives, including those listed directly or by reference in the agreement between the GVI and FTA that funds any part of this Contract, as they may be amended or promulgated from time to time during the term of this Contract. Contractor’s failure to so comply shall constitute a material breach of this Contract.

GC 9.6 Changes of Law

Changes of Law that become effective after the Proposal Due Date may result in price changes. If a price adjustment is indicated, either upward or downward, it shall be negotiated between the GVI and the Contractor and the final Contract price will be adjusted upwards or downwards to reflect such changes in Law. Such price adjustment may be audited, where required.

GC 9.7 Governing Law and Choice of Forum

This Contract shall be governed by the laws of the Government of the United States Virgin Islands without regard to conflict of law rules. The Contractor consents to the jurisdiction of the identified United States Virgin Islands.

GC 9.8 Disputes (Reserved)

GC 9.9 Maintenance of Records; Access by GVI; Right to Audit Records

In accordance with 49 CFR § 18.36(i), 49 CFR § 19.48(d), and 49 USC § 5325(a), provided the GVI is the FTA recipient or a sub-grantee of the FTA recipient, the Contractor agrees to provide the GVI, FTA, the Comptroller General of the United States, the Secretary of the U.S. Department of Transportation (DOT), The Government of the United States Virgin Islands or any of their duly authorized representatives access to any books, documents, papers and records of the Contractor that are directly pertinent to or relate to this Contract (1) for the purpose of making audits, examinations, excerpts and transcriptions and (2) when conducting an audit and inspection.

1. In the event of a sole source Contract, single Proposal, single responsive Proposal, or competitive negotiated procurement, the Contractor shall maintain and the Contracting Officer, the DOT(if applicable) or the representatives thereof shall have the right to examine all books, records, documents and other cost and pricing data related to the Contract price, unless such pricing is based on adequate price competition, established catalog or market prices of commercial items sold in substantial quantities to the public, or prices set by law or regulation, or combinations thereof. Data related to the negotiation or performance of the Contract shall be made available for the purpose of evaluating the accuracy, completeness and currency of the cost or pricing data. The right of examination shall extend to all documents necessary for adequate evaluation of the cost or pricing data, along with the computations and projections used therein, including review of accounting principles and practices that reflect properly all direct and indirect costs anticipated for the performance of the Contract.
2. For Contract modifications or change orders the Contracting Officer, the DOT, if applicable, or their representatives shall have the right to examine all books, records, documents and other cost and pricing data related to a Contract modification, unless such pricing is based on adequate price competition, established catalog or market prices of commercial items sold in substantial

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quantities to the public, or prices set by law or regulation, or combinations thereof. Data related to the negotiation or performance of the Contract modification or change order shall be made available for the purpose of evaluating the accuracy, completeness and currency of the cost or pricing data. The right of examination shall extend to all documents necessary for adequate evaluation of the cost or pricing data, along with the computations and projections used therein, either before or after execution of the Contract modification or change order for the purpose of conducting a cost analysis. If an examination made after execution of the Contract modification or change order reveals inaccurate, incomplete or out-of-date data, the Contracting Officer may renegotiate the Contract modification or change order price adjustment, and the GVI shall be entitled to any reductions in the price that would result from the application of accurate, complete or up-to-date data. Lines 2 to end of paragraph are off by one space on the left margin.

The requirements of this section are in addition to other audit, inspection and record-keeping provisions specified elsewhere in the Contract documents.

NOTE: FTA does not require contractors to flow down these requirements to Subcontractors.

GC 9.10 Confidential Information

Access to government records is governed by the laws of the United States Virgin Islands. Except as otherwise required by the laws of the United States Virgin Islands, the GVI will exempt from disclosure proprietary information, trade secrets and confidential commercial and financial information submitted or disclosed during the Contract period. Any such proprietary information, trade secrets or confidential commercial and financial information that a Contractor believes should be exempted from disclosure shall be specifically identified and marked as such. Blanket-type identification by designating whole pages or sections as containing proprietary information, trade secrets or confidential commercial and financial information will not ensure confidentiality. The specific proprietary information, trade secrets or confidential commercial and financial information must be clearly identified as such.

Upon a request for records from a third party regarding the Contract, the GVI will notify the Contractor in writing. The Contractor must respond within twenty (20) days with the identification of any and all “proprietary, trade secret or confidential commercial or financial” information, and the Contractor shall indemnify the GVI’s defense costs associated with its refusal to produce such identified information; otherwise, the requested information may be released.

The GVI shall employ sound business practices no less diligent than those used for the GVI’s own confidential information to protect the confidence of all licensed technology, software, documentation, drawings, schematics, manuals, data and other information and material provided by the Contractor pursuant to the Contract that contain confidential commercial or financial information, trade secrets or proprietary information as defined in or pursuant to the laws of the United States Virgin Islands against disclosure of such information and material to third parties except as permitted by the Contract. The Contractor shall be responsible for ensuring that confidential commercial or financial information, trade secrets or proprietary information, with such determinations to be made by the GVI in its sole discretion, bears appropriate notices relating to its confidential character.

During the performance of the Work under the Contract, it may be necessary for either party (the “Discloser”) to make confidential information available to the other party (the “Recipient”). The Recipient agrees to use all such information solely for the performance of the Work under the Contract and to hold all such information in confidence and not to disclose same to any third party without the

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prior written consent of the Discloser. Likewise, the Recipient agrees that all information developed in connection with the Work under the Contract shall be used solely for the performance of the Work under the Contract, and shall be held in confidence and not disclosed to any third party without the prior written consent of the Discloser.

This Confidentiality section shall survive the termination or expiration of the Contract.

GC 9.11 Conflicts of Interest, Gratuities

No member, officer, or employee of the GVI or of a local public body during his or her tenure, thereafter, shall have any interest, direct or indirect, in this Contract or the proceeds thereof.

GC 9.12 General Nondiscrimination Clause

In connection with the performance of Work provided for under this Contract, the Contractor agrees that it will not, on the grounds of race, religious creed, color, national origin, ancestry, physical disability, medical condition, marital status, sex, sexual orientation or age, discriminate or permit discrimination against any person or group of people in any manner prohibited by federal, state or local laws.

GC 9.13 Amendment and Waiver

GC 9.13.1. Amendment

Any modification or amendment of any provisions of any of the Contract documents shall be effective only if in writing, signed by authorized representatives of both the GVI and Contractor, and specifically referencing this Contract.

GC 9.13.2. Waiver

In the event that either party elects to waive its remedies for any breach by the other party of any covenant, term or condition of this Contract, such waiver shall not limit the waiving party's remedies for any succeeding breach of that or of any other term, covenant or condition of this Contract.

GC 9.14 Remedies not Exclusive

The rights and remedies of the GVI provided herein shall not be exclusive and are in addition to any other rights and remedies provided by law or under the Contract.

GC 9.15 Counterparts

This Contract may be executed in any number of counterparts. All such counterparts shall be deemed to constitute one and the same instrument, and each of said counterparts shall be deemed an original thereof.

GC 9.16 Severability

Whenever possible, each provision of the Contract shall be interpreted in a manner as to be effective and valid under applicable law. However, if any provision, or part of any provision, should be prohibited or invalid under applicable law, such provision, or part of such provision, shall be ineffective to the extent of such prohibition or invalidity without invalidating the remainder of such provision or the remaining provisions of the Contract.

GC 9.17 Third-Party Beneficiaries

No provisions of the Contract shall in any way inure to the benefit of any third party, including the public at large, so as to constitute such person a third-party beneficiary of the Contract or of any one or more of the terms and conditions of the Contract or otherwise give rise to any cause of action in any person not a party to the Contract, except as expressly provided elsewhere in the Contract.

GC 9.18 Assignment of Contract

Neither party will assign or subcontract its rights nor will obligations under the Contract without prior written permission of the other party, and no such assignment or subcontract be effective until approved in writing by the other party.

GC 9.19 Independent Parties

The Contractor is an independent contractor with respect to the performance of all Work hereunder, retaining control over the detail of its own operations, and the Contractor shall not be considered the agent, employee, partner, fiduciary or trustee of the GVI.

GC 9.20 Survival

The following sections shall survive the nominal expiration or discharge of other Contract obligations, and the GVI may obtain any remedy under law, Contract or equity to enforce the obligations of the Contractor that survive the manufacturing, warranty and final payment periods:

- “Intellectual Property Warranty”
- “Data Rights”
- “Indemnification”
- “Governing Law and Choice of Forum”
- “Disputes”
- “Confidential Information”
- “Parts Availability Guarantee”
- “Access to Records”
- “Training”

GC 10. GVI-Specific Provisions (Reserved)

SECTION 4: SPECIAL PROVISIONS

SP 1. Inspection, Tests and Repairs

SP 1.1 Pilot Bus

SP 1.2 Configuration and Performance Approval

In order to assess the Contractor's compliance with the Technical Specifications, the GVI and the Contractor shall, at the Pre-Production Meeting, jointly develop a configuration and performance review document for review of the pilot vehicle. This document shall include appropriate performance standards for each test that is being required and the document shall become part of the official record of the pre-production meeting.

SP 1.3 First Article Inspection – Production

The purpose of a first article inspection is to confirm that any components, systems, subsystems, major assemblies, subassemblies, products, parts, apparatuses, articles and other materials comply with the Technical Specifications and other Contract documents.

Where required by the Contract documents or requested by the GVI, the Contractor shall cause first article inspections to be conducted. A first article inspection may include both a physical configuration inspection and a functional demonstration. First article inspections shall be conducted at the Contractor or Subcontractor's facility. The Contractor shall furnish to the GVI prior to each first article inspection a written inspection and demonstration plan for each item for review. The GVI's inspectors will attend each first article inspection unless the GVI provides a written waiver of its right to attend any such inspection. The results of each first article inspection shall be documented by the Contractor in a format deemed acceptable by the GVI, and all documents relating to the inspection shall be forwarded to the GVI.

SP 1.4 Post-Delivery Tests

The GVI will conduct acceptance tests on each delivered bus. These tests shall be completed within fifteen (15) days after bus delivery and shall be conducted in accordance with written test plans. The purpose of these tests is to identify Defects that have become apparent between the time of bus release and delivery to the GVI. The post-delivery tests shall include visual inspection and bus operations. No post-delivery test shall apply criteria that are different from the criteria applied in an analogous pre-delivery test (if any).

Buses that fail to pass the post-delivery tests are subject to non-acceptance. The GVI shall record details of all Defects on the appropriate test forms and shall notify the Contractor of acceptance or non-acceptance of each bus according to "Inspection, Testing and Acceptance" after completion of the tests. The Defects detected during these tests shall be repaired according to procedures defined in "Repairs after Non-Acceptance."

SP 1.5 Repairs after Non-Acceptance

The Contractor, or its designated representative, shall perform the repairs after non-acceptance. If the Contractor fails or refuses to begin the repairs within five (5) days, then the Work may be done by the GVI's personnel with reimbursement by the Contractor.

SP 1.6 Repair Performance

SP 1.6.1 Repairs by Contractor

After non-acceptance of the bus, the Contractor must begin Work within five (5) working days after receiving notification from the GVI of failure of acceptance tests. The GVI shall make the bus available to complete repairs timely with the Contractor repair schedule.

The Contractor shall provide, at its own expense, all spare parts, tools and space required to complete the repairs. At the GVI's option, the Contractor may be required to remove the bus from the GVI's property while repairs are being made. If the bus is removed from the GVI's property, repair procedures must be diligently pursued by the Contractor's representatives, and the Contractor shall assume risk of loss while the bus is under its control.

SP 1.6.2 Repairs by the Government of the Virgin Islands (GVI)

The GVI will not take responsibility to correct Defects, except to replace defective parts as instructed by the Contractor.

1. **Parts used.** If the GVI performs the repairs after non-acceptance of the bus, it shall correct or repair the Defect and any Related Defects using Contractor-specified parts available from its own stock or those supplied by the Contractor specifically for this repair. Reports of all repairs covered by this procedure shall be submitted by the GVI to the Contractor for reimbursement or replacement of parts monthly, or at a period to be mutually agreed upon. The Contractor shall provide forms for these reports.
2. **Contractor-supplied parts.** If the Contractor supplies parts for repairs being performed by the GVI after non-acceptance of the bus, these parts shall be shipped prepaid to the GVI.
3. **Return of defective components.** The Contractor may request that parts covered by this provision be returned to the manufacturing plant. The total costs for this action shall be paid by the Contractor.
4. **Reimbursement for labor.** The GVI shall be reimbursed by the Contractor for labor. The amount shall be determined by the GVI for a qualified mechanic at a straight time wage rate which includes fringe benefits and overhead adjusted for the GVI's rate in effect at the time the Work is performed, plus the cost of towing in the bus, if such action was necessary. Such wage and fringe benefits rates shall not exceed the rates in effect in the GVI's service garage at the time the Defect correction is made.
5. **Reimbursement for parts.** The GVI shall be reimbursed by the Contractor for defective parts that must be replaced to correct the Defect. The reimbursement shall include taxes where applicable and fifteen (15) percent handling costs.

SP 2. Deliveries

SP 2.1 Bus Delivery

Delivery of buses shall be determined by signed receipt of the GVI's designated agent(s), at point(s) of delivery (to be determined) and may be preceded by a cursory inspection of the bus.

SP 2.2 Delivery Schedule

The buses shall be delivered at a rate not to exceed one (1) bus per week. Delivery of the vehicles shall be completed within 360 days after Notice of Award. Delivery shall be completed within 36 weeks after

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delivery of the executed Contract documents. Hours of delivery shall be 8:00 a.m. to 5:00 p.m. on the following days of the week: Monday Through Friday.

SP 2.3 Contract Deliverables

Contract deliverables associated with this Contract are set forth in the table below, along with other pertinent information. Contract deliverables shall be submitted in accordance with Section 6: Technical Specifications. Due dates shown note the last acceptable date for receipt of Contract deliverables. The GVI will consider early receipt of Contract deliverables on a case-by-case basis. The reference section designates the appropriate specification section(s) where the requirement is referenced.

NOTE: Table 1 below provides a sample list of Contract deliverables. This list should be adapted by the GVI to reflect the Contract deliverables required by the Contract specifications.

	Deliverable	GVI Action	Reference Section	Due Date	Format	Quantity Due
1.	Bus Testing — Altoona Test Report	Review			Electronic Media Hardcopy	1
2.	List of serialized units installed on each bus	Review		With each delivered bus	Electronic Media	1 per bus
3.	Copy of Manufacturers formal Quality Assurance Program	Review		Pre-award site visit	Electronic Media Hardcopy	1
4.	QA manufacturing certificate	Review		With each delivered bus	Electronic Media Hardcopy	1 per bus
5.	QA purchasing certifications acknowledging receipt of applicable specification	Review		30 days following first pre-production meeting	Electronic Media Hardcopy	1 per major Supplier
6.	Pre-Delivery Bus Documentation Package	Review		With each delivered bus	Electronic Media Hardcopy	1 per bus
7.	Motor Vehicle Pollution Requirements Certificate	Review		With each bus	Electronic Media Hardcopy	1
8.	Engine Emissions Certificate — NOx levels	Review		Prior to completion of pilot bus	Electronic Media Hardcopy	1
9.	Pre-production meeting minutes	Approval		30 days after each meeting	Electronic Media Hardcopy	2 originals

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	Deliverable	GVI Action	Reference Section	Due Date	Format	Quantity Due
10.	Driver's log and incident report	Review		With each bus delivery if driveaway service is used	Electronic Media Hardcopy	1 per bus
11.	Title documentation	Review		10 days prior to bus delivery	Electronic Media Hardcopy	1 per bus
12.	Performance bond	Review		30 days following execution of Contract	Electronic Media Hardcopy	1
13.	Insurance certificates	Approval		Before Work commences	Electronic Media Hardcopy	1
14.	Engineering support	Review		During pre-production meeting	Electronic Media Contracts	1
15.	Training instructor information	Approval		30 days prior to delivery of pilot bus	Electronic Media	1
16.	Training curriculum	Approval		30 days prior to delivery of pilot bus	Electronic Media	1
17.	Teaching materials	Review		During classroom instruction	Electronic Media Hardcopy	1
18.	Professionally prepared mechanics' "Bus Orientation" training video	Review		30 days prior to first production bus	Electronic Media	20 each
19.	Final preventative maintenance manuals	Review	SP 7.2	90 days after GVI written approval	Electronic Media Hardcopy	1 per bus plus 4
20.	Final diagnostic procedures manuals	Review	SP 7.2	90 days after GVI written approval	Electronic Media Hardcopy	1 per bus plus 4
21.	Final parts manuals	Approval	SP 7.2	90 days after GVI written approval	Electronic Media Hardcopy	1 per bus plus 4
22.	Component repair manuals (GVI approval/review period of 90 days from date of receipt)	Approval	SP 7.2	90 days after GVI written approval of OEM component repair list	Electronic Media Hardcopy	1 per bus plus 4

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	Deliverable	GVI Action	Reference Section	Due Date	Format	Quantity Due
23.	Draft preventative maintenance manuals (GVI approval/review period of 90 days from date of receipt)	Approval	SP 7.2		Electronic Media Hardcopy	4
24.	Draft diagnostic procedures manuals (GVI approval/review period of 90 days from date of receipt)	Approval	SP 7.2		Electronic Media Hardcopy	4
25.	Draft parts manuals. (GVI approval/review period of 90 days from date of receipt)	Approval	SP 7.2		Electronic Media Hardcopy	4
26.	List of OEM component repair manuals	Approval	SP 7.2		Electronic Media Hardcopy	4
27.	Draft operators' manuals (GVI approval/review period of 90 days from date of receipt)	Approval	SP 7.2	maximum of 30 days prior to start of production	Electronic Media Hardcopy	4
28.	Final operators' manuals	Review	SP 7.2	30 days following GVI approval of draft manual	Electronic Media Hardcopy	50
29.	Recommended spare parts list, including bill of materials	Review		60 days prior to shipment of first bus	Electronic Media Hardcopy	1
30.	Part number index	Approval		60 days prior to shipment of first bus	Electronic Media Hardcopy Spreadsheet	1 1
31.	Current price list	Review		90 days after GVI written approval of draft parts manual	Electronic Media Hardcopy	20
32.	In-process drawings	Review		30 days prior to production	Electronic Media Scale drawings	1
33.	Electrical and air schematics	Review		30 days prior to production	Electronic Media Hardcopy	1

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	Deliverable	GVI Action	Reference Section	Due Date	Format	Quantity Due
34.	As-built drawings	Review		Within 60 days after final bus delivery	Electronic Media	1
35.	Material samples	Review		By conclusion of pre-production meetings	Samples	1
36.	Undercoating system program	Approval		First pre-production meeting	Electronic Media Hardcopy	1
37.	Flooring certificate	Review		First pre-production meeting	Electronic Media Certificate/ copy of purchase order	1
38.	Interior features – fire-resistance certificates	Review		Prior to pilot bus completion	Electronic Media Certificates	1
39.	Crashworthiness	Review		Pre-award audit	Electronic Media Certificate	1
40.	Technical review of electronic functionality	Approval		Prior to production	Electronic Media Hardcopy	1
41.	Interior security camera layout	Approval		Prior to pilot bus completion	Electronic Media Copies of interior views	1 each
42.	Technical review of powerplant			Prior to production		
43.	Powerplant certifications	Review			Electronic Media Hardcopy	1 each
44.	Striping layout	Approval		Prior to production	Electronic Media Hardcopy	1

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	Deliverable	GVI Action	Reference Section	Due Date	Format	Quantity Due
45.	Resolution of issues "subject to GVI approval"	Approval		Prior to production	Electronic Media Hardcopy	1
46	Certified weight slips	Review	TS 5.2	With delivery of each bus	Electronic Media Hardcopy	1 per bus
47	List of special tools and pricing	Review	TS 5.4	With proposal	Electronic Media Hardcopy	1
48	Results of noise test including with engine braking	Approval	TS 5.8	Prior to production	Electronic media	1
49	Performance analysis for acceleration and gradability	Approval	TS 7	During pre-production meeting	Electronic media	1
50	Application approval from engine and transmission manufacturers for cooling system	Approval	TS 10.3	Prior to production	Electronic Media Hardcopy	1
51	FMVSS 121 Brake Test Report	Review	TS 35 TS 37.2	During pre-production meeting	Electronic media	1
52	Electrical load analysis	Approval	TS 40.1.7	Prior to production	Electronic media	1
53	Air conditioning test report	Approval	TS 52	Prior to production	Electronic media	1
54	Standard repair time manual	Review	SP 7.2	Prior to delivery	Electronic Media Hardcopy	4
55	List of spare parts and pricing	Review		With proposal	Electronic Media Hardcopy	1

SP 3. Options and Option Pricing

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The Contractor hereby grants the Government of the Virgin Islands and any permissible assignee Options to purchase up to ten (10) additional buses. The Options shall be valid for a period of five (5) years from the effective date of the Contract. There shall be no minimum order quantity for any permissible assignee. Subject to the Government of the Virgin Islands right to order modifications, the Option Buses shall have the same specifications as the vehicle purchased under this Contract. The Government of the Virgin Islands may exercise the Options by written notice to the Contractor (“Notice of Exercise of Options”) at any time on or before the five years following the effective date of the Contract.

The price of the Option Buses shall be the unit price of the base order vehicles, (“Base Order Price”) adjusted by multiplying the base order price by the following fraction:

$$\frac{\text{Latest Published Preliminary Index Number Prior to Notice of Exercise of Option}}{\text{Index Number on Effective Date of the Contract}}$$

The Index shall be the Producer Price Index for Truck and Bus Bodies, Series No. 1413, published by the United States Department of Labor Bureau of Labor Statistics, or if such Index is no longer in use, then such replacement that is most comparable to the Index as may be designated by the Bureau of Labor Statistics or as agreed by the parties.

Within thirty (30) days after delivery of the Notice of Exercise of Option to the Contractor, the Contractor shall submit a proposed delivery schedule. Along with the proposed delivery schedule, the Contractor will provide the Government of the Virgin Islands with access to its production schedule for the purpose of the parties verifying available production capacity. The production schedule shall include a reasonable time for mobilization and for coordinating with other Bus orders, and it shall be based upon a production rate at least equal to the production rate actually realized with respect to the base order Buses.

If the parties are unable to agree on a production schedule, the maximum term for the production of the Option Buses shall not exceed a total of eight months after the date of Notice to Proceed with Option Buses production. The Government of the Virgin Islands or any permissible assignee may issue a Notice to Proceed at any time after the Contractor submits its proposed delivery schedule. The Contractor shall not commence production of the Options Buses prior to issuance of the Notice to Proceed by the Government of the Virgin Islands or any permissible assignee of the Government of the Virgin Islands for the Option Buses incorporating the agreed production delivery schedule or the eight month maximum term.

SP 4. Assignability of Options

If the GVI does not exercise the option(s) as listed in “Options and Option Pricing,” then the GVI reserves the right to assign the option(s) to other grantees of FTA funds in accordance with FTA Circular 4220.1F or its successors.

SP 5. Payment

The GVI shall pay and the Contractor the amounts set forth in the price schedule as full compensation for all costs and expenses of completing the Work in accordance with the Contract, including but not limited to all labor, equipment and material required, overhead, expenses, storage and shipping, risks and obligations, taxes (as applicable), fees and profit, and any unforeseen costs.

SP 5.1 Payment Terms

Progress Payments with Retention

All payments shall be made as provided herein, less a retention of ten percent (10%) plus any additional amount retained as provided below and less any amounts for liquidated damages in accordance with “Liquidated Damages for Late Delivery of the Bus.”

The GVI shall make progress payments to the Contractor for buses in accordance with the performance milestones set forth below.

Title to material included in any progress payment request shall pass to the GVI upon payment by the GVI. Said title shall be free of all encumbrances. However, such transfer of title shall not relieve the Contractor of its responsibility for the furnishing, installation, fabrication or inclusion of said materials as a deliverable element of buses procured in accordance with the requirements of the Contract.

The performance milestones and payment limits shall be as follows:

1. The GVI shall make payments for buses at 25% of the unit price for each bus itemized in the price schedule upon verification by the GVI’s representative and/or inspector that said bus(es) have completed engine installation and within 30 calendar days of receipt of a proper invoice. Invoices submitted under this milestone shall include a listing of all major components and component serial numbers that shall be the same as in the final bus record.
2. The GVI shall make payments for buses at 25% of the unit price for each bus itemized in the price schedule upon verification by the GVI’s representative and/or inspector that said bus(es) are driveable and within 30 calendar days of receipt of a proper invoice. Invoices submitted under this milestone shall include a listing of all major components and component serial numbers that shall be the same as in the final bus record.
3. The GVI shall make payments for buses at 25% of the unit price for each bus itemized in the price schedule when the GVI’s representative and/or inspector has approved shipment of said bus(es) from the Contractor’s plant and within 30 calendar days of receipt of a proper invoice.
4. The GVI shall make payments for buses at 19% of the unit price for each bus itemized in the price schedule upon the delivery and acceptance of each bus and within 30 calendar days of receipt of a proper invoice.
5. The GVI shall make payment of 3% of the total amount for all buses in the price schedule within thirty (30) calendar days after the completion of training and receipt of a proper invoice.
6. The GVI shall make payment of 3% of the total amount for all buses in the price schedule within thirty (30) calendar days after delivery and acceptance of all Documents and receipt of a proper invoice.
7. The GVI shall make payments for spare parts and/or equipment at the unit prices itemized in the price schedule upon the delivery and acceptance of said spare parts and/or equipment and within 30 calendar days of receipt of a proper invoice.

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Title for spare parts and/or equipment shall transfer to the GVI upon payment. Said title shall be free of all encumbrances.

8. The GVI shall make a final payment of all retained funds within 60 calendar days of receipt of a proper invoice and the following:
 - Delivery and acceptance of all Contract deliverables, including manuals and other documentation required by the Contract, excluding training.
 - Contractor provision of any certifications as required by law and/or regulations.
 - Completion of post-delivery audits required under the Contract.

Progress payment requests shall be accompanied by a certification, or affidavit, signed by the Contractor's officer certifying that the Work covered by the progress payment requested has been completed. The GVI reserves the rights of inspection and audit to verify said progress as provided in "Maintenance of Records; Access by GVI; Right to Audit Records."

The Contractor may charge interest for late payment if payment is delayed more than ten (10) days after the payment Due Date set forth above. Interest will be charged at a rate not to exceed the prime rate of interest published by The Wall Street Journal on the 10th day.

SP 5.2 Performance Guarantee

The Contractor shall furnish, at its own expense, performance guarantee in the form of a cashier's check, a letter of credit in a form approved by the GVI, or a performance bond from a surety duly licensed to do business in the United State Virgin Islands having a financial rating from A.M. Best Company of "A VIII" or better, in the amount of one hundred percent of the contract value. The bond shall cover all of the Contractor's obligations under the Contract except for the warranty and shall remain in force until said obligations have been fulfilled.

SP 5.3 Payment of Taxes

Unless otherwise provided in this Contract, the Contractor shall pay all federal, state and local taxes, and duties applicable to and assessable against any Work, goods, services, processes and operations incidental to or involved in the Contract, including but not limited to retail sales and use, transportation, export, import, business and special taxes. The Contractor is responsible for ascertaining and paying the taxes when due. The total Contract price shall include compensation for all taxes the Contractor is required to pay by laws in effect on the Proposal Due Date. The Contractor will maintain auditable records, subject to the GVI reviews, confirming that tax payments are current at all times.

SP 6. Liquidated Damages for Late Delivery of the Bus

It is mutually understood and agreed by and between the parties to the Contract that time is of the essence with respect to the completion of the Work and that in case of any failure on the part of the Contractor to deliver the buses within the time specified in "Delivery Schedule," except for any excusable delays as provided in "Excusable Delays/Force Majeure" or any extension thereof, the GVI will be damaged thereby. The amount of said damages, being difficult if not impossible of definite ascertainment and proof, it is hereby agreed that the amount of such damages due to the GVI shall be fixed at one hundred dollars (\$100.00) per business day per bus not delivered in substantially as good condition as inspected by the GVI at the time released for shipment.

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The Contractor hereby agrees to pay the aforementioned amounts as fixed, agreed and liquidated damages, and not by way of penalty, to the GVI and further authorizes the GVI to deduct the amount of the damages from money due the Contractor under the Contract, computed as aforesaid. If the money due the Contractor is insufficient or no money is due the Contractor, then the Contractor shall pay the GVI the difference or the entire amount, whichever may be the case, within thirty (30) days after receipt of a written demand by the Contracting Officer.

The payment of aforesaid fixed, agreed and liquidated damages shall be in lieu of any damages for any loss of profit, loss of revenue, loss of use, or for any other direct, indirect, special or consequential losses or damages of any kind whatsoever that may be suffered by the GVI arising at any time from the failure of the Contractor to fulfill the obligations referenced in this clause in a timely manner.

SP 7. Service and Parts

SP 7.1 Contractor Service and Parts Support

The Contractor shall state on the form Contractor Service and Parts Support Data the representatives responsible for assisting the GVI, as well as the location of the nearest distribution center, which shall furnish a complete supply of parts and components for the repair and maintenance of the buses to be supplied. The Contractor also shall state below, or by separate attachment, its policy on transportation charges for parts other than those covered by warranty.

SP 7.2 Documentation

The Contractor shall provide one (1) per bus plus an additional four (4) current maintenance manual(s) to include preventative maintenance procedures, diagnostic procedures or trouble-shooting guides and major component service manuals, one (1) per bus plus an additional four (4) current parts manual(s), and 50 hardcopy standard operator's manual(s) as part of this Contract. The Contractor shall also provide four (4) standard repair time manuals. The Contractor also shall exert its best efforts to keep maintenance manuals, operator manuals and parts books up to date for a period of fifteen (15) years. The supplied manuals shall incorporate all equipment ordered on the buses covered by this procurement. In instances where copyright restrictions or other considerations prevent the Contractor from incorporating major components information into the bus parts and service manuals, separate manual sets as published by the subcomponent Supplier will be provided.

SP 7.3 Parts Availability Guarantee

The Contractor hereby guarantees to provide, within reasonable periods of time, the spare parts, software and all equipment necessary to maintain and repair the buses supplied under this Contract for a period of at least twelve (12) years after the date of acceptance. Parts shall be interchangeable with the original equipment and shall be manufactured in accordance with the quality assurance provisions of this Contract. Prices shall not exceed the Contractor's then-current published catalog prices.

Where the parts ordered by the GVI are not received within two working days of the agreed-upon time and date and a bus procured under this Contract is out of service due to the lack of said ordered parts, then the Contractor shall provide the GVI, within eight (8) hours of the GVI's verbal or written request, the original Suppliers' and/or manufacturers' parts numbers, company names, addresses, telephone numbers and contact persons' names for all of the specific parts not received by the GVI.

Where the Contractor fails to honor this parts guarantee or parts ordered by the GVI are not received within thirty (30) days of the agreed-upon delivery date, then the Contractor shall provide to GVI, within

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seven (7) days of the GVI's verbal or written request, the design and manufacturing documentation for those parts manufactured by the Contractor and the original Suppliers' and/or manufacturers' parts numbers, company names, addresses, telephone numbers and contact persons' names for all of the specific parts not received by the GVI. The Contractor's design and manufacturing documentation provided to the GVI shall be for its sole use in regard to the buses procured under this Contract and for no other purpose.

SP 7.4 GVI-Furnished Property

In the event that equipment or other goods or materials are specified in the Technical Specifications to be furnished by the GVI to the Contractor for incorporation in the Work, the following provisions shall apply:

The GVI shall furnish the equipment, goods or materials in a timely manner so as not to delay Contract delivery or performance dates. If GVI-furnished property is received in a condition not suitable for the intended use, then the Contractor shall promptly notify the GVI, detailing the facts, and at the GVI's expense repair, modify, return or take such other action as directed by the GVI. The parties may conduct a joint inspection of the property before the Contractor takes possession to document its condition.

The GVI retains title to all GVI-furnished property. Upon receipt of the GVI-furnished property, the Contractor assumes the charge and care of the property and bears the risk of loss or damage due to action of the elements or from any other cause. The Contractor shall provide appropriate protection for all such property during the progress of the Work. Should any GVI-furnished equipment or materials be damaged, such property shall be repaired or replaced at the Contractor's expense to the satisfaction of the GVI. No extension of time will be allowed for repair or replacement of such damaged items. Should the Contractor not repair or replace such damaged items, the GVI shall have the right to take corrective measures itself and deduct the cost from any sums owed to the Contractor.

Warranty administration and enforcement for GVI-furnished equipment are the responsibility of the GVI, unless the parties agree to transfer warranty responsibility to the Contractor.

SP 8. Federal Motor Vehicle Safety Standards (FMVSS)

The Contractor shall submit one (1) manufacturer's FMVSS self-certification, Federal Motor Vehicles Safety Standards, that the vehicle complies with relevant FMVSS or two manufacturer's certified statement that the contracted buses will not be subject to FMVSS regulations.

SP 9. Insurance

The Contractor shall maintain in effect during the term of this Contract, including any warranty period, at its own expense, at least the following coverage and limits of insurance:

- Statutory Workers Compensation and Employers Liability insurance and/or qualified self-insurance program covering Supplier's employees while on GVI property.
- Commercial General Liability Insurance:
 - Bodily Injury and Property Damage, including Contractual Liability covering the indemnification contained herein, \$10,000,000 combined single limits per occurrence, \$10,000,000 aggregate, where applicable.

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- Product liability: \$5,000,000 per occurrence, for a period of five (5) years after acceptance of the last bus delivered under this Contract (Products Liability coverage may be effected through one or more excess liability policies).
- Automobile Liability Insurance: Bodily Injury and Property Damage, \$1,000,000 combined single limits per occurrence.

Contractor shall deliver to the GVI, within ten (10) days after receiving Notice of Award of this Contract, evidence of the above. Prior to the expiration of any insurance during the time required, the Supplier shall furnish evidence of renewal to the GVI's Contract Administrator.

SP 10. Software Escrow Account

All Contractor's policies shall contain an endorsement naming the GVI as an additional insured and providing that written notice shall be given to GVI location at least thirty (30) days prior to termination, cancellation or material reduction of coverage in the policy; provided, however, that such notice may be given on ten (10) days notice if the termination is due to nonpayment of premium.

Upon execution of the Contract, the Contractor shall provide the GVI a list of all OEM software comprising proprietary works ("Proprietary Software") for all major vehicle subsystems. From time to time and only upon request, information contained within the listed software may be made available to the GVI through the OEM of the vehicle subsystem. The Contractor and OEM are not obligated to provide copies of source code as this is proprietary intellectual property; however, the Contractor is obligated to assist the GVI with any technical assistance for the duration of the life of the vehicle. It is the GVI's prerogative to evaluate the long-term viability of the Contractor and its Subcontractors and Suppliers based upon the criteria set forth in "Qualification Requirements."

SP 11. Agency-Specific Provisions Reserved

SECTION 5: FEDERAL REQUIREMENTS

FR 1. Access to Records

The Contractor agrees to maintain all books, records, accounts and reports required under this Contract for a period of not less than three years after the date of termination or expiration of this Contract, except in the event of litigation or settlement of claims arising from the performance of this Contract, in which case Contractor agrees to maintain same until the GVI, the FTA Administrator, the Comptroller General of the United States or any of their duly authorized representatives have disposed of all such litigation, appeals, claims or exceptions related thereto. Reference 49 CFR 18.39(i)(11).

The following access to records requirements apply to this Contract:

FR 1.1 Local Governments

In accordance with 49 CFR 18.36(i), the Contractor agrees to provide the GVI, the FTA Administrator, the Comptroller General of the United States or any of their authorized representatives access to any books, documents, papers and records of the Contractor that are directly pertinent to this Contract for the purposes of making audits, examinations, excerpts and transcriptions. Contractor also agrees, pursuant to 49 CFR 633.17 to provide the FTA Administrator or his authorized representatives including any PMO Contractor access to Contractor's records and construction sites pertaining to a major capital project, defined at 49 USC 5302(a)1, which is receiving federal financial assistance through the programs described at 49 USC 5307, 5309 or 5311.

FR 1.2 State Governments

In accordance with 49 CFR 633.17, the Contractor agrees to provide the GVI, the FTA Administrator or his authorized representatives, including any PMO Contractor, access to the Contractor's records and construction sites pertaining to a major capital project, defined at 49 USC 5302(a)1, which is receiving federal financial assistance through the programs described at 49 USC 5307, 5309 or 5311. By definition, a major capital project excludes contracts of less than the simplified acquisition threshold currently set at \$100,000.

The Contractor agrees to permit any of the foregoing parties to reproduce by any means whatsoever or to copy excerpts and transcriptions as reasonably needed.

FR 2. Federal Funding, Incorporation of FTA Terms and Federal Changes

The preceding provisions include, in part, certain standard terms and conditions required by the DOT, whether or not expressly set forth in the preceding Contract provisions. All contractual provisions required by the DOT, as set forth in FTA Circular 4220.1F or its successors are hereby incorporated by reference. Anything to the contrary herein notwithstanding, all FTA mandated terms shall be deemed to control in the event of a conflict with other provisions contained in this agreement. The Contractor shall not perform any act, fail to perform any act or refuse to comply with any GVI requests that would cause GVI to be in violation of the FTA terms and conditions.

The Contractor shall at all times comply with all applicable FTA regulations, policies, procedures and directives, including without limitation those listed directly or by reference in the Master Agreement

between the GVI and FTA, as they may be amended or promulgated from time to time during the term of this Contract. Contractor's failure to so comply shall constitute a material breach of this Contract.

FR 3. Federal Energy Conservation Requirements

The Contractor agrees to comply with mandatory standards and policies relating to energy efficiency that are contained in the Territory's energy conservation plan issued in compliance with the Energy Policy and Conservation Act.

FR 4. Civil Rights Requirements

The following requirements apply to the underlying Contract:

1. **Nondiscrimination:** In accordance with Title VI of the Civil Rights Act, as amended, 42 USC § 2000d, section 303 of the Age Discrimination Act of 1975, as amended, 42 USC § 6102, section 202 of the Americans with Disabilities Act of 1990, 42 USC § 12132, and federal transit law at 49 USC § 5332, the Contractor agrees that it will not discriminate against any employee or applicant for employment because of race, color, creed, national origin, sex, age, or disability. In addition, the Contractor agrees to comply with applicable federal implementing regulations and other implementing requirements FTA may issue.
2. **Equal Employment Opportunity:** The following equal employment opportunity requirements apply to the underlying Contract:
 - (a) **Race, Color, Creed, National Origin, Sex:** In accordance with Title VII of the Civil Rights Act, as amended, 42 USC § 2000e, and federal transit laws at 49 USC § 5332, the Contractor agrees to comply with all applicable equal employment opportunity requirements of U.S. Department of Labor (U.S. DOL) regulations, "Office of Federal Contract Compliance Programs, Equal Employment Opportunity, Department of Labor," 41 CFR Parts 60 *et seq.*, (which implement Executive Order No. 11246, "Equal Employment Opportunity," as amended by Executive Order No. 11375, "Amending Executive Order 11246 Relating to Equal Employment Opportunity," 42 USC § 2000e note), and with any applicable federal statutes, executive orders, regulations, and federal policies that may in the future affect construction activities undertaken in the course of the Project. The Contractor agrees to take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, color, creed, national origin, sex, or age. Such action shall include, but not be limited to, the following: employment, upgrading, demotion or transfer, recruitment or recruitment advertising, layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. In addition, the Contractor agrees to comply with any implementing requirements FTA may issue.
 - (b) **Age:** In accordance with section 4 of the Age Discrimination in Employment Act of 1967, as amended, 29 USC §§ 623 and federal transit law at 49 USC § 5332, the Contractor agrees to refrain from discrimination against present and prospective employees for reason of age. In addition, the Contractor agrees to comply with any implementing requirements FTA may issue.
 - (c) **Disabilities:** In accordance with section 102 of the Americans with Disabilities Act, as amended, 42 USC § 12112, the Contractor agrees that it will comply with the

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requirements of U.S. Equal Employment Opportunity Commission, “Regulations to Implement the Equal Employment Provisions of the Americans with Disabilities Act,” 29 CFR Part 1630, pertaining to employment of persons with disabilities. In addition, the Contractor agrees to comply with any implementing requirements FTA may issue.

3. The Contractor also agrees to include these requirements in each subcontract financed in whole or in part with federal assistance provided by FTA, modified only if necessary to identify the affected parties.

FR 5. No Government Obligation to Third Parties

1. The GVI and Contractor acknowledge and agree that, notwithstanding any concurrence by the federal government in or approval of the Solicitation or award of the underlying Contract, absent the express written consent by the federal government, the federal government is not a party to this Contract and shall not be subject to any obligations or liabilities to the GVI, Contractor, or any other party (whether or not a party to that Contract) pertaining to any matter resulting from the underlying Contract.
2. The Contractor agrees to include the above clause in each subcontract financed in whole or in part with federal assistance provided by FTA. It is further agreed that the clause shall not be modified, except to identify the Subcontractor who will be subject to its provisions.

FR 6. Program Fraud and False or Fraudulent Statements or Related Acts

1. The Contractor acknowledges that the provisions of the Program Fraud Civil Remedies Act of 1986, as amended, 31 USC §§ 3801 *et seq.* and U.S. DOT regulations, “Program Fraud Civil Remedies,” 49 CFR Part 31, apply to its actions pertaining to this Project. Upon execution of the underlying Contract, the Contractor certifies or affirms the truthfulness and accuracy of any statement it has made, it makes, it may make, or causes to be made, pertaining to the underlying Contract or the FTA assisted project for which this Contract Work is being performed. In addition to other penalties that may be applicable, the Contractor further acknowledges that if it makes, or causes to be made, a false, fictitious, or fraudulent claim, statement, submission, or certification, the federal government reserves the right to impose the penalties of the Program Fraud Civil Remedies Act of 1986 on the Contractor to the extent the federal government deems appropriate.
2. The Contractor also acknowledges that if it makes, or causes to be made, a false, fictitious, or fraudulent claim, statement, submission, or certification to the federal government under a Contract connected with a project that is financed in whole or in part with federal assistance originally awarded by FTA under the authority of 49 USC § 5307, the Government reserves the right to impose the penalties of 18 USC § 1001 and 49 USC § 5307(n)(1) on the Contractor, to the extent the federal government deems appropriate.
3. The Contractor agrees to include the above two clauses in each subcontract financed in whole or in part with federal assistance provided by FTA. It is further agreed that the clauses shall not be modified, except to identify the Subcontractor who will be subject to the provisions.

FR 7. Suspension and Debarment

This Contract is a covered transaction for purposes of 49 CFR Part 29. As such, the Contractor is required to verify that none of the Contractor, its principals, as defined at 49 CFR 29.995, or affiliates, as defined at 49 CFR 29.905, are excluded or disqualified as defined at 49 CFR 29.940 and 29.945.

The Contractor is required to comply with 49 CFR 29, Subpart C, and must include the requirement to comply with 49 CFR 29, Subpart C, in any lower-tier covered transaction it enters into.

By signing and submitting its bid or Proposal, the Proposer certifies as follows:

The certification in this clause is a material representation of fact relied upon by the GVI. If it is later determined that the Proposer knowingly rendered an erroneous certification, in addition to remedies available to the GVI, the federal government may pursue available remedies, including but not limited to suspension and/or debarment. The Proposer agrees to comply with the requirements of 49 CFR 29, Subpart C, while this Proposal is valid and throughout the period of any Contract that may arise from this Proposal. The Proposer further agrees to include a provision requiring such compliance in its lower tier covered transactions.

FR 8. Disadvantaged Business Enterprise (DBE)

This Contract is subject to the requirements of Title 49, Code of Federal Regulations, Part 26, Participation by Disadvantaged Business Enterprises in DOT Financial Assistance Programs.

The Contractor shall maintain compliance with “DBE Approval Certification” throughout the period of Contract performance.

The Contractor shall not discriminate on the basis of race, color, national origin or sex in the performance of this Contract. The Contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of this DOT-assisted Contract. Failure by the Contractor to carry out these requirements is a material breach of this Contract, which may result in the termination of this Contract or such other remedy as the GVI deems appropriate. Each subcontract the Contractor signs with a Subcontractor must include the assurance in this paragraph (see 49 CFR 26.13(b)).

FR 9. Clean Water Requirements

4. The Contractor agrees to comply with all applicable standards, orders or regulations issued pursuant to the Federal Water Pollution Control Act, as amended, 33 USC 1251 *et seq.* The Contractor agrees to report each violation to the GVI and understands and agrees that the GVI will, in turn, report each violation as required to assure notification to FTA and the appropriate Environmental Protection Agency (EPA) Regional Office.
8. The Contractor also agrees to include these requirements in each subcontract exceeding \$100,000 financed in whole or in part with federal assistance provided by FTA.

FR 10. Clean Air Requirements

5. The Contractor agrees to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act, as amended, 42 USC §§ 7401 *et seq.* The Contractor agrees to report each violation to the GVI and understands and agrees that the GVI will, in turn, report each violation as required to assure notification to FTA and the appropriate EPA Regional Office.

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6. The Contractor also agrees to include these requirements in each subcontract exceeding \$100,000 financed in whole or in part with federal assistance provided by FTA.

FR 11. Compliance with Federal Lobbying Policy

Contractors who apply or bid for an award of \$100,000 or more shall file the certification required by 49 CFR Part 20, "New Restrictions on Lobbying." Each tier certifies to the tier above that it will not and has not used federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any GVI, a member of Congress, an officer or employee of Congress, or an employee of a member of Congress in connection with obtaining any federal Contract, grant or any other award covered by 31 USC 1352. Each tier shall also disclose the name of any registrant under the Lobbying Disclosure Act of 1995 who has made lobbying contacts on its behalf with non-federal funds with respect to that federal Contract, grant or award covered by 31 USC 1352. Such disclosures are forwarded from tier to tier up to the recipient.

FR 12. Buy America

The Contractor agrees to comply with 49 USC 5323(j) and 49 CFR Part 661, which provide that federal funds may not be obligated unless steel, iron and manufactured products used in FTA-funded projects are produced in the United States, unless a waiver has been granted by FTA or the product is subject to a general waiver. General waivers are listed in 49 CFR 661.7. A general public interest waiver from the Buy America requirements applies to microprocessors, computers, microcomputers, software or other such devices, which are used solely for the purpose of processing or storing data. This general waiver does not extend to a product or device that merely contains a microprocessor or microcomputer and is not used solely for the purpose of processing or storing data.

Separate requirements for rolling stock are set out at 49 USC 5323(j)(2)(C) and 49 CFR 661.11. Rolling stock must be assembled in the United States and have a 60 percent domestic content.

A Proposer must submit to the GVI the appropriate Buy America Certification with all offers on FTA-funded contracts, except those subject to a general waiver. Proposals that are not accompanied by a properly completed Buy America certification are subject to the provisions of 49 CFR 661.13 and may be rejected as nonresponsive.

FR 13. Testing of New Bus Models

The Contractor agrees to comply with 49 USC A 5323(c) and FTA's implementing regulation at 49 CFR Part 665 and shall perform the following:

1. A manufacturer of a new bus model or a bus produced with a major change in components or configuration shall provide a copy of the final test report to the recipient at a point in the procurement process specified by the recipient, which will be prior to the recipient's final acceptance of the first vehicle.
2. A manufacturer who releases a report under Paragraph 1 above shall provide notice to the operator of the testing facility that the report is available to the public.
3. If the manufacturer represents that the vehicle was previously tested, the vehicle being sold should have the identical configuration and major components as the vehicle in the test report,

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which must be provided to the recipient prior to recipient's final acceptance of the first vehicle. If the configuration or components are not identical, the manufacturer shall provide a description of the change and the manufacturer's basis for concluding that it is not a major change requiring additional testing.

4. If the manufacturer represents that the vehicle is "grandfathered" (has been used in mass transit service in the United States before October 1, 1988, and is currently being produced without a major change in configuration or components), the manufacturer shall provide the name and address of the recipient of such a vehicle and the details of that vehicle's configuration and major components.

FR 14. Pre-Award and Post-Delivery Audits

The Contractor agrees to comply with 49 USC § 5323(l) and FTA's implementing regulation at 49 CFR Part 663 and to submit the following certifications:

1. **Buy America requirements:** The Contractor shall complete and submit a declaration certifying either compliance or noncompliance with Buy America. If the recommended Proposer certifies compliance with Buy America, it shall submit documentation that lists (1) component and subcomponent parts of the rolling stock to be purchased identified by manufacturer of the parts, their country of origin and costs; and (2) the location of the final assembly point for the rolling stock, including a description of the activities that will take place at the final assembly point and the cost of final assembly.
2. **Solicitation specification requirements:** The Contractor shall submit evidence that it will be capable of meeting the bid specifications.
3. **Federal Motor Vehicle Safety Standards (FMVSS):** The Contractor shall submit either (1) a manufacturer's FMVSS self-certification, that the vehicle complies with relevant FMVSS regulations or (2) a manufacturer's certified statement that the contracted buses will not be subject to FMVSS regulations.

FR 15. Cargo Preference

The Contractor agrees to the following:

- To use privately owned U.S.-flag commercial vessels to ship at least fifty (50) percent of the gross tonnage (computed separately for dry bulk carriers, dry cargo liners and tankers) involved, whenever shipping any equipment, material or commodities pursuant to the underlying Contract to the extent such vessels are available at fair and reasonable rates for U.S.-flag commercial vessels;
- To furnish within twenty (20) working days following the date of loading for shipments originating within the United States or within thirty (30) working days following the date of loading for shipments originating outside the United States, a legible copy of a rated, "on-board" commercial ocean bill of lading in English for each shipment of cargo described in the preceding paragraph to the Division of National Cargo, Office of Market Development, Maritime Administration, Washington, DC 20590 and to the FTA recipient (through the Contractor in the case of a Subcontractor's bill-of-lading.)
- To include these requirements in all subcontracts issued pursuant to this Contract when the subcontract may involve the transport of equipment, material or commodities by ocean vessel.

FR 16. Fly America

The Contractor agrees to comply with 49 USC 40118 (the “Fly America” Act) in accordance with the General Services Administration’s regulations at 41 CFR Part 301-10, which provide that recipients and sub recipients of federal funds and their contractors are required to use U.S. flag air carriers for U.S. government-financed international air travel and transportation of their personal effects or property, to the extent such service is available, unless travel by foreign air carrier is a matter of necessity, as defined by the Fly America Act. The Contractor shall submit, if a foreign air carrier was used, an appropriate certification or memorandum adequately explaining why service by a U.S. flag air carrier was not available or why it was necessary to use a foreign air carrier and shall, in any event, provide a certificate of compliance with the Fly America requirements. The Contractor agrees to include the requirements of this section in all subcontracts that may involve international air transportation.

SECTION 6: TECHNICAL SPECIFICATIONS

GENERAL

TS 1. Scope

These Technical Specifications define requirements for a high-floor or low-floor heavy-duty transit bus, which will be used by the GVI on the roads of St. Thomas, St John and St. Croix in the U.S. Virgin Islands. The bus shall have right-hand drive and the doors shall be on the left side. It shall have a minimum expected life of 12 years or 500,000 miles, whichever comes first, and is intended for the widest possible spectrum of passengers, including children, adults, the elderly, and persons with disabilities.

TS 2. Definitions

Alternative. An alternative specification condition to the default bus configuration. The GVI may define alternatives to the default configuration to satisfy local operating requirements.

Alternatives to the default configuration are clearly identified by a border.

Ambient Temperature. The temperature of the surrounding air.

Analog Signals. A continuously variable signal that is solely dependent upon magnitude to express information content.

NOTE: Analog signals are used to represent the state of variable devices such as rheostats, potentiometers, temperature probes, etc.

Audible Discrete Frequency: An audible discrete frequency is determined to exist if the sound power level in any 1/3-octave band exceeds the average of the sound power levels of the two adjacent 1/3-octave bands by 4 decibels (dB) or more.

Battery Compartment. Low-voltage energy storage, i.e., 12/24 VDC batteries.

Class of Failures. Classes of failures are described below.

- **Class 1: Physical Safety.** A failure that could lead directly to passenger or driver injury or represents a severe crash situation.
- **Class 2: Road Call.** A failure resulting in an en route interruption of passenger service. Service is discontinued until the bus is replaced or repaired at the point of failure.
- **Class 3: Bus Change.** A failure that requires removal of the bus from service during its assignments. The bus is operable to a rendezvous point with a replacement bus.
- **Class 4: Bad Order.** A failure that does not require removal of the bus from service during its assignments but does degrade bus operation. The failure shall be reported by operating personnel.

Code. A legal requirement.

Curb Weight. Weight of vehicle, including maximum fuel, oil and coolant; and all equipment required for operation and required by this Specification, but without passengers or driver.

dBA. Decibels with reference to 0.0002 microbar as measured on the “A” scale.

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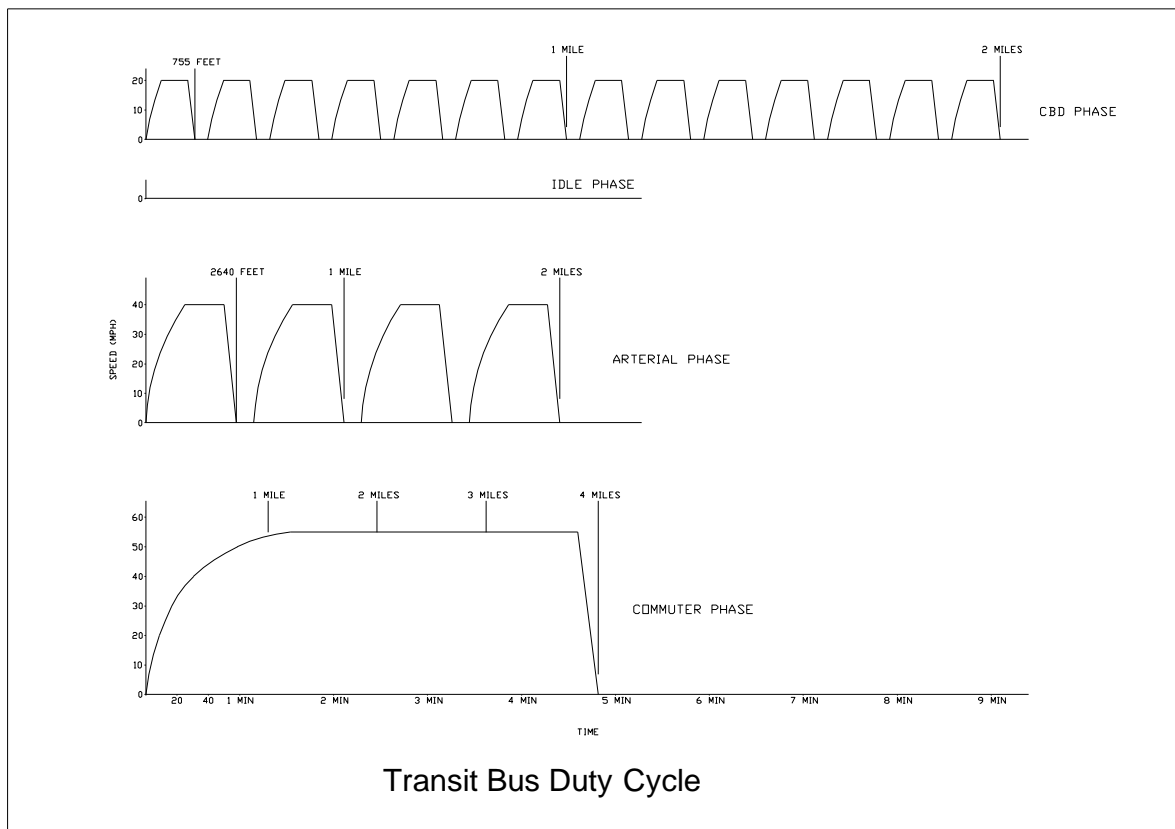
Default Configuration Bus. The bus described if no alternatives are selected. Signing, colors, the destination sign reading list and other information must be provided by the GVI.

Design Operating Profile. The operating profile for design purposes shall consist of simulated transit type service. The duty cycle is described in the figure “Transit Bus Duty Cycle.” The duty cycle consists of three phases to be repeated in sequence: a central business district (CBD) phase of 2 miles with 7 stops per mile and a top speed of 20 mph, an arterial route phase of 2 miles with 2 stops per mile and a top speed of 40 mph, and a commuter phase of 4 miles with 1 stop and a maximum speed of 55 mph and a 5 minute idle phase.

Phase	Stops/ Mile	Top Speed (mph)	Miles	Accel. Dist. (ft.)	Accel. Time (s)	Cruise Dist. (ft.)	Cruise Time (s)	Decel. Rate (fpsps)	Decel. Dist. (ft.)	Decel. Time (s)	Dwell Time (s)	Cycle Time (min-s)	Total Stops
CBD	7	20	2	155	10	540	18.5	6.78	60	4.5	7	9-20	14
Idle	-	-	-	-	-	-	-	-	-	-	-	5-0	-
Arterial	2	40	2	1035	29	1350	22.5	6.78	255	9	7	4-30	4
CBD	7	20	2	155	10	510	18.5	6.78	60	4.5	7	9-20	14
Arterial	2	40	2	1035	35	1350	22.5	6.78	255	9	7	4-30	4
CBD	7	20	2	155	10	510	18.5	6.78	60	4.5	7	9-20	14
Commuter	1 stop for phase	Max. or 55	4	5500	90	2 miles + 4580 ft.	188	6.78	480	12	20	5-10	1
Total			14									47-10	51

Average Speed – 17.8 mph

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The bus shall be loaded to seated load weight (SLW) and shall average approximately 18 mph while operating on this duty cycle. Operation shall continue regardless of the ambient temperature or weather conditions. The passenger doors shall be opened and closed at each stop, and the bus shall be knelt at each stop during the CBD phase. The braking profile shall be:

- 16 percent of the stops at 3 ft/sec/sec
- 50 percent of the stops at 6 ft/sec/sec
- 26 percent of the stops at 9 ft/sec/sec
- 8 percent of the stops at 12 ft/sec/sec

These percentages of stops shall be evenly distributed over the three phases of the duty cycle. For scheduling purposes, the average deceleration rate is assumed.

A High Density Urban (HDU) Operating Profile may be applicable to this operation. In addition to the above requirements, this profile shall be taken into account during the design of subsystems such as charging, air, brakes and radiator/coolers. The HDU profile consists of mostly CBD type operating with some arterial, and minimal commuter. However, number of stops per mile and loading conditions may be greater than those specified for the CBD cycle. The HDU profile is characterized by the following:

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Average Speed	9 to 10 mph
Average Idle Time	50%
Percent Time at 0 to 19 mph	80% range
Percent Time at 20 mph & above	20%

Average speed is defined as the miles traveled divided by the hours of engine operation. Much of the “idle” time is due to stop and go nature of the service of the HDU operation. The majority of this idle time is while the bus is in gear and stopped in traffic, or at bus stops as well as frequent brake applications per mile due to traffic congestion and traffic signals.

In addition to these requirements the Virgin Islands operation has unique operating conditions due to its climatic environment, which consists of high year round temperatures and salt laden trade winds blowing across the Caribbean Sea. The islands have rough roads with very steep grades and tight turning radii. These conditions along with the heavy passenger loading and high mileage of operation put a great deal of strain on the bus and its components. The design of the bus must consider these conditions. A description of the grades is provided in section TS 7.2 Gradability.

Destroyed. Physically made permanently unusable.

Discrete Signal. A signal that can take only pre-defined values, usually of a binary 0 or 1 nature where 0 is battery ground potential and 1 is a defined battery positive potential.

DPF. Diesel particulate filter.

Driver's Eye Range. The 95th-percentile ellipse defined in SAE Recommended Practice J941, except that the height of the ellipse shall be determined from the seat at its reference height.

Fire Resistant. Materials that have a flame spread index less than 150 as measured in a radiant panel flame test per ASTM-E 162-90.

Fireproof. Materials that will not burn or melt at temperatures less than 2000 °F.

Free Floor Space: Floor area available to standees, excluding the area under seats, area occupied by feet of seated passengers, the vestibule area forward of the standee line, and any floor space indicated by manufacturer as non-standee areas such as, the floor space “swept” by passenger doors during operation. Floor area of 1.5 sq ft shall be allocated for the feet of each seated passenger that protrudes into the standee area.

GAWR (Gross Axle Weight Rating). The maximum total weight as determined by the axle manufacturer, at which the axle can be safely and reliably operated for its intended purpose.

Gross Load. 150 lbs for every designed passenger seating position, for the driver, and for each 1.5 square feet of free floor space.

GVW (Gross Vehicle Weight). Curb weight plus gross load.

GVWR (Gross Vehicle Weight Rating): The maximum total weight as determined by the vehicle manufacturer, at which the vehicle can be safely and reliably operated for its intended purpose.

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Hose: Flexible line.

Labeled. Equipment or materials to which has been attached a label, symbol or other identifying mark of an organization, which is acceptable to the authority having jurisdiction and concerned with product evaluation, which maintains periodic inspection of production labeled equipment or materials, and by whose labeling the manufacturer indicates compliance with appropriate standards or performance in a specified manner.

Line: All tubes, flexible and hard, that carry fluids.

Local Regulations. Regulations below the state level.

Low-Floor Bus. A bus that, between at least the front (entrance) and rear (exit) doors, has a floor sufficiently low and level so as to remove the need for steps in the aisle between the doors and in the vicinity of these doors.

Maintenance Personnel Skill Levels.

- **5M:** Specialist Mechanic or Class A Mechanic Leader
- **4M:** Journeyman or Class A Mechanic
- **3M:** Service Mechanic or Class B Servicer
- **2M:** Mechanic Helper or Bus Servicer
- **1M:** Cleaner, Fueller, Oiler, Hostler, or Shifter

Metallic Hose. A hose whose strength depends primarily on the strength of its metallic parts; it can have metallic liners or covers, or both.

Module. Assembly of individual components.

Motor (Electric). A device that converts electrical energy into mechanical energy.

Physical Layer. The first layer of the seven-layer International Standards Organization (ISO) Open Systems Interconnect (OSI) reference model. This provides the mechanical, electrical, functional and procedural characteristics required to gain access to the transmission medium (e.g., cable) and is responsible for transporting binary information between computerized systems.

Pipe: Nonflexible line.

Power. Work or energy divided by time.

Real-Time Clock (RTC). Computer clock that keeps track of the current time.

Retarder. Device used to augment or replace some of the functions of primary friction based braking systems of the bus.

Seated Load. 150 lbs for every designed passenger seating position and for the driver.

SLW (Seated Load Weight). Curb weight plus seated load.

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Serial Data Signals. A current loop based representation of ASCII or alphanumeric data used for transferring information between devices by transmitting a sequence of individual bits in a prearranged order of significance.

NOTE: An example is the communication that takes place between two or more electronic components with the ability to process and store information.

Special Tools. Tools not normally stocked by the GVI.

Specification. A particular or detailed statement, account, or listing of the various elements, materials, dimensions, etc., involved in the manufacturing and construction of a product.

Standard. A firm guideline from a consensus group.

Standards. Standards referenced in the Technical Specifications” are the latest revisions unless otherwise stated.

Standee Line. A line marked across the bus aisle to designate the forward area that passengers may not occupy when the bus is moving.

Stress Loops. The “pig-tails” commonly used to absorb flexing in piping.

Structure. The structure shall be defined as the basic body, including floor deck material and installation, load bearing external panels, structural components, axle mounting provisions and suspension beams and attachment points.

Wheelchair. A mobility aid belonging to any class of three- or four-wheeled devices, usable indoors, designed for and used by individuals with mobility impairments, whether operated manually or powered. A “common wheelchair” is such a device that does not exceed 30 inches in width and 48 inches in length measured 2 inches above the ground, and does not weigh more than 600 lbs when occupied.

TS 3. Referenced Publications

The documents or portions thereof referenced within this specification shall be considered part of the requirements of the specification. The edition indicated for each referenced document is the current edition, as of the date of the American Public Transportation Association (APTA) issuance of this specification, October 2010.

TS 4. Legal Requirements

The Contractor shall comply with all applicable federal, state and local regulations. These shall include but not be limited to Americans with Disability Act (ADA), as well as state and local accessibility, safety and security requirements. Local regulations are defined as those below the state level.

Buses shall meet all applicable Federal Motor Vehicle Safety Standards (FMVSS) and shall accommodate all applicable Federal Motor Carrier Safety Regulations (FMCSR) in effect at location of the GVI and the date of manufacture.

In the event of any conflict between the requirements of these specifications and any applicable legal requirement, the legal requirement shall prevail. Technical requirements that exceed the legal requirements are not considered to conflict.

TS .5 Overall Requirements

The Contractor shall ensure that the application and installation of major bus subcomponents and systems are compliant with all such subcomponent vendors' requirements and recommendations. Contractor and the GVI shall identify subcomponent vendors that shall submit installation/application approval documents with the completion of a pilot or lead bus. Components used in the vehicle shall be of heavy-duty design and proven in transit service.

TS 51 Weight

It shall be a design goal to construct each bus as light in weight as possible without degradation of safety, appearance, comfort, traction or performance.

Buses at a capacity load shall not exceed the tire factor limits, brake test criteria or structural design criteria.

Maximum gross axle weight rating shall be 23,000 lbs.

The Contractor shall submit a certified weight slip for the curb weight of each axle and a certified weight slip for the total curb weight of each bus upon delivery.

TS 5.2 Capacity

The bus shall be designed to carry the gross vehicle weight (GVW), which shall not exceed the bus gross vehicle weight rating (GVWR).

The bus shall be design to carry a minimum of 46 passengers, seated and standees, at 1.5 square feet of free floor space per standee.

TS 5.3 Service Life

The minimum useful design life of the bus in transit service shall be at least twelve (12) years or 500,000 miles. It shall be capable of operating at least 40,000 miles per year, including the 12th year.

TS 5.4 Maintenance and Inspection

Scheduled maintenance or inspection tasks as specified by the Contractor shall require a skill level of 3M or less. Scheduled maintenance tasks shall be grouped in maximum mileage intervals and shall be in accordance with the manufacturer's recommended preventative maintenance schedule (along with routine daily service performed during the fueling operations). Higher levels of scheduled maintenance tasks shall occur at even multiples of mileage for lower level tasks.

Test ports, as required, shall be provided for commonly checked functions on the bus, such as air intake, exhaust, hydraulic, pneumatic, charge-air and engine cooling systems.

The coach manufacturer shall give prime consideration to the routine problems of maintaining the vehicle. All coach components and systems, both mechanical and electrical, that will require periodic physical work or inspection processes shall be installed so that a minimum of time is consumed in gaining access to the critical repair areas. It shall not be necessary to disassemble portions of the coach structure and/or equipment such as seats and flooring under seats in order to gain access to these areas. Each coach shall be designed to facilitate the disassembly, reassembly, servicing or maintenance, using tools and equipment that are normally available as standard commercial items.

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Requirements for the use of unique specialized tools will be minimized. The body and structure of the coach shall be designed for ease of maintenance and repair. Individual panels or other equipment which may be damaged in normal service shall be repairable or replaceable. Ease of repair shall be related to the vulnerability of the item to damage in service.

Contractor shall provide a list of all special tools and pricing required for maintaining this equipment. At a minimum, the list shall include the items in Attachment 3 – Minimum List of Tools and Equipment. This list shall be submitted as a supplement to the Pricing Schedule.

NOTE: Tools such as compartment door keys, bellows gauges and other tools that are required for daily maintenance and inspections shall not be included in the special tool list and shall be furnished for each coach.

Based upon the Design Operating Profile, routine scheduled maintenance actions, such as filter replacement and adjustments, shall not be required at intervals of less than 6,000 miles, except for engine oil/filter change intervals for severe duty, as defined by the engine manufacturer, or as indicated from a regular oil analysis program and routine daily service performed during the fueling operations.

The Contractor shall provide a Standard Repair Times Manual listing the times required for typical repair and service items on the bus.

TS 5.5 Interchangeability

Unless otherwise agreed, all units and components procured under this Contract, whether provided by Suppliers or manufactured by the Contractor, shall be duplicates in design, manufacture and installation to ensure interchangeability among buses in each order group in this procurement. This interchangeability shall extend to the individual components as well as to their locations in the buses. These components shall include, but are not limited to, passenger window hardware, interior trim, lamps, lamp lenses and seat assemblies. Components with non-identical functions shall not be, or appear to be, interchangeable.

Any one component or unit used in the construction of these buses shall be an exact duplicate in design, manufacture and assembly for each bus in each order group in this Contract. Contractor shall identify and secure approval for any changes in components or unit construction provided within a Contract.

In the event that the Contractor is unable to comply with the interchangeability requirement, the Contractor must notify the GVI and obtain the GVI' prior written approval, including any changing in pricing.

The GVI shall review proposed product changes on a case-by-case basis and shall have the right to require extended warranties to ensure that product changes perform as least as well as the originally supplied products.

TS 5.6 Training

The purpose of the training program is to provide the employees (drivers, mechanics, and supervisory personnel) of the GVI and its agents, an understanding of the operation and maintenance of the vehicle. The Contractor shall, within 30 days after acceptance of the first vehicle, submit to the Project Manager for review and acceptance a draft maintenance training program including course training schedule outline and course materials. The training shall be delivered by a qualified instructor(s) at the GVI' property and shall include training of personnel on all shifts. Each day of training shall be 8 hours minimum duration. The Contractor shall also provide visual and other teaching aids for use by the GVI. The training schedule shall be established by the Project Manager within the guidelines below.

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The Contractor shall provide 4 days of training (2 days on St. Thomas and 2 days on St. Croix) on operating the vehicle and emergency procedures (jacking and towing). This training shall start within 2 days after the first vehicle has been delivered.

The Contractor shall provide 4 days of training (2 days on St. Thomas and 2 days on St. Croix) on preventive maintenance procedures. This training shall start within 14 days after the first vehicle has been delivered.

The Contractor shall provide 20 days of comprehensive maintenance training. Maintenance training shall start within 14 days after the first vehicle has been delivered.

Technical/Service Representatives

The Contractor shall, at its own expense, have one or more competent technical service representatives available on request to assist the GVI in the solution of engineering or design problems within the scope of the specifications that may arise during the warranty period. This does not relieve the Contractor of responsibilities under the provisions of "Section 7: Warranty Requirements."

TS 5.7 Operating Environment

The bus shall achieve normal operation in ambient temperature ranges of 10 °F to 115 °F, at relative humidity between 5 percent and 100 percent, and at altitudes up to 3000 feet above sea level. Degradation of performance due to atmospheric conditions shall be minimized at temperatures below 10 °F, above 115 °F or at altitudes above 3000 feet. Altitude requirements above 3000 feet will need separate discussions with the engine manufacturer to ensure that performance requirements are not compromised. Speed, gradability and acceleration performance requirements shall be met at, or corrected to, 77 °F, 29.31 inches Hg, dry air per SAE J1995.

The U.S. Virgin Islands have a tropical marine climate tempered by steady Northeast trade winds. There is little seasonal temperature variation. Average daily low temperatures range from 72°F to 78°F; average highs range from 86°F to 91°F. There is high humidity and a rainy season from May to October. The damp, salty air accelerates rust and corrosion of unprotected metal.

The Islands have rough roads with very steep grades (24%) and tight turning radii. These conditions, along with high sun load, heat and humidity and the heavy passenger loading and high mileage of operation put a great deal of strain on the bus and its components. The design of the bus must consider these conditions.

It is recommended that the Proposer visit all three of the U.S. Virgin Islands to see the actual operating conditions.

TS 5.8 Noise

Noise testing shall be conducted in accordance with SAE International (SAE) J366.

In addition, the bus shall meet interior and exterior noise requirements while the engine brake is operating.

Interior Noise

The combination of inner and outer panels and any material used between them shall provide sufficient sound insulation so that a sound source with a level of 80 dBA measured at the outside skin of the bus shall have a sound level of 65 dBA or less at any point inside the bus. These conditions shall prevail with all openings, including doors and windows, closed and with the engine and accessories switched off.

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The bus-generated noise level experienced by a passenger at any seat location in the bus shall not exceed 80 dBA. The driver area shall not experience a noise level of more than 75 dBA.

Exterior Noise

Airborne noise generated by the bus and measured from either side shall not exceed 80 dBA under full power acceleration when operated 0 to 35 mph at curb weight.

The maximum noise level generated by the bus pulling away from a stop at full power shall not exceed 80 dBA.
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The bus-generated noise at curb idle shall not exceed 65 dBA. If the noise contains an audible discrete frequency, a penalty of 5 dBA shall be added to the sound level measured. The Contractor shall comply with the exterior noise requirements defined in local laws and ordinances identified by the GVI and SAE J366.

TS 5.9 Fire Safety

The bus shall be designed and manufactured in accordance with all applicable fire safety and smoke emission regulations. These provisions shall include the use of fire-retardant/low-smoke materials, fire detection systems, bulkheads and facilitation of passenger evacuation.

No fire suppression system is required.

All materials used in the construction of the passenger compartment of the bus shall be in accordance with the Recommended Fire Safety Practices defined in FMVSS 302, dated October 20, 1993. Materials entirely enclosed from the passenger compartment, such as insulation within the sidewalls and sub-floor, need not comply. In addition, smaller components and items, such as seat grab rails, switch knobs and small light lenses, shall be exempt from this requirement.

TS 5.10 Respect for the Environment

In the design and manufacture of the bus, the Contractor shall make every effort to reduce the amount of potentially hazardous waste. In accordance with Section 6002 of the Resource Conservation and Recovery Act, the Contractor shall use, whenever possible and allowed by the specifications, recycled materials in the manufacture of the bus.

The Contractor shall also make every effort to reduce the amount of potentially hazardous waste generated by the GVI when maintaining the bus in accordance with the procedures contained in the manufacturer's maintenance manuals. The manufacturer shall use non-asbestos brake blocks and gaskets and, whenever possible, LED lighting.

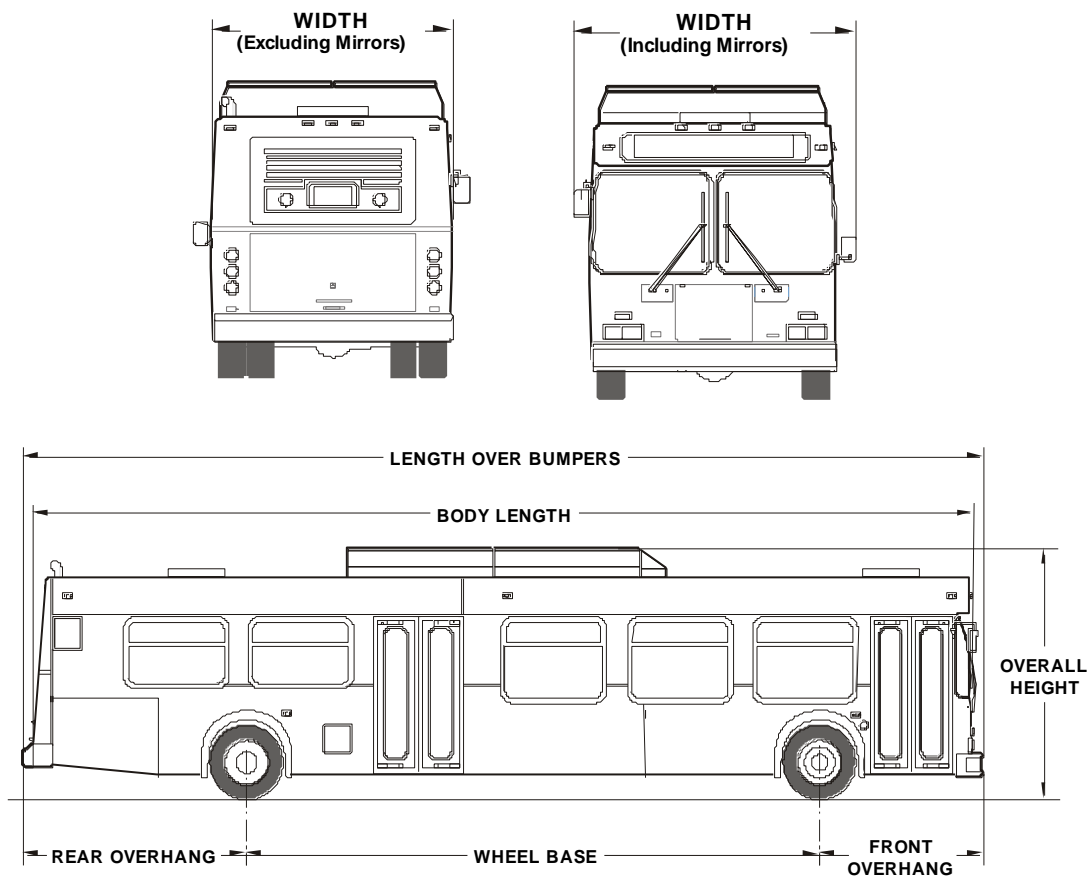
DIMENSIONS

TS 6. Physical Size

With exceptions such as exterior mirrors, marker and signal lights, bumpers, fender skirts, washers, wipers, ad frames, cameras, object detection systems, bicycle racks, feelers and rub rails, the bus shall have the following overall dimensions as shown in Figure 1 at static conditions and design height.

Note: Figure 1 is for reference only. The specified bus shall have doors on the left side.

FIGURE 1
Transit Bus Exterior Dimensions



TS 6.1 Bus Length

For ease of use, the following tolerances will be allowable for each given bus length. Bus length is determined as the measurement from bumper to bumper.

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Bus length shall be no less than 29 feet 6 inches and no greater than 32 feet.

TS 6.2 Bus Width

Maximum body width shall be 96 inches.

TS 6.3 Bus Height

Maximum overall height shall be 128 inches, including all rigid, roof-mounted items such as A/C, exhaust, fuel system and cover, etc.

TS 6.4 Step Height

A maximum of three steps shall be required for passenger ingress and egress. The steps on each doorway shall be in a fixed location relative to the floor of the bus. At the front door, the first step up from the street level shall not exceed 15.5 inches with the bus at the design height, and all step riser heights shall be the same height within ± 0.25 inches and shall be no more than 10 inches.

At the rear door where the lift shall be located, the interior steps down from the floor level shall not exceed 11 3/8 inches, and final step to the street level shall not exceed 16 inches with the bus at the design height

TS 6.5 Underbody Clearance

The bus shall maintain the minimum clearance dimensions as shown in Figure 2 and defined in SAE J689, regardless of load up to the GVWR.

TS 6.6 Ramp Clearances

The approach angle is the angle measured between a line tangent to the front tire static loaded radius arc and the initial point of structural interference forward of the front tire to the ground.

The departure angle is the angle measured between a line tangent to the rear tire static loaded radius arc and the initial point of structural interference rearward of the rear tire to the ground.

The breakover angle is the angle measured between two lines tangent to the front and rear tire static loaded radius and intersecting at a point on the underside of the vehicle that defines the largest ramp over which the vehicle can roll.

TABLE 2

Angle	Clearance
Approach	10 degrees (min.)
Breakover	13 degrees (min.)
Departure	11 degrees (min.)

TS 6.7 Ground Clearance

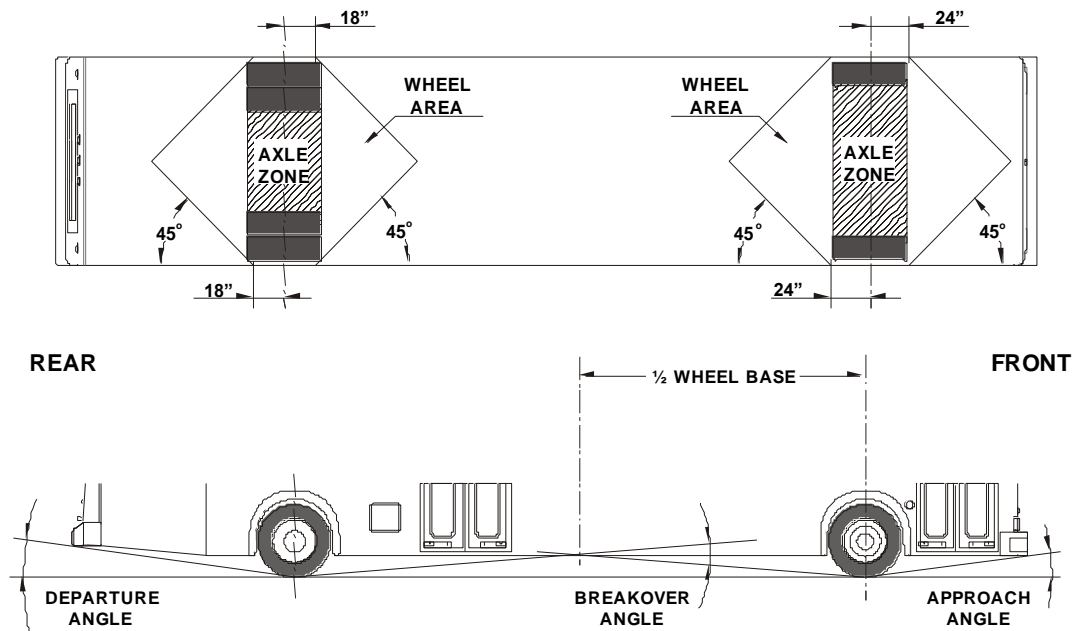
Ground clearance shall be no less than 9 inches, (8 inches at jacking pad) except within the axle zone and wheel area.

Axle zone clearance, which is the projected area between tires and wheels on the same axial centerline, shall be no less than 5.4 inches.

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Wheel area clearance shall be no less than 8 inches for parts fixed to the bus body and 6 inches for parts that move vertically with the axles.

FIGURE 2
Transit Bus Minimum Road Clearance



TS 6.8 Floor Height

The bus shall be either high-floor or low-floor design.

High-floor: Height of the floor above the street shall be no more than 35 1/2 inches measured at the centerline of the front doorway and 38 1/2 inches measured at the centerline of the rear doorway. The floor may be inclined only along the longitudinal axis of the bus, and the incline shall be less than 1 1/2 degrees of the horizontal. All floor measurements shall be with the bus at the design height and on a level surface with the standard installed tires.

Low-Floor: Height of the step above the street shall be no more than 16 inches measured at the centerline of the front and rear doorway. The floor may be inclined along the longitudinal axis of the bus, and the incline shall not exceed 3.5 degrees off the horizontal except locally at the doors where 2 degree slope toward the door is allowed. All floor measurements shall be with the bus at the design running height and on a level surface and with the standard installed tires. A maximum of two steps is allowed to accommodate a raised aisle floor in the rear of the bus.

TS 6.9 Interior Headroom

Headroom above the aisle and at the centerline of the aisle seats shall be no less than 78 inches in the forward half of the bus tapering to no less than 74 inches forward of the rear settee. At the centerline of the window seats, headroom shall be no lower than 65 inches, except for parcel racks and reading lights, if specified. Headroom at the back of the rear bench seat may be reduced to a minimum of 56 inches, but it shall increase to the ceiling height at the front of the seat cushion. In any area of the bus directly over the head of a seated passenger and positioned where a passenger entering or leaving the seat is prone to strike his or her head, padding shall be provided on the overhead paneling.

TS 6.10 Aisle Width

The minimum clear aisle width between pairs of transverse seats with all attached hardware shall be at least 22 inches.

The aisle width between the front wheelhouses (low-floor bus) shall be at least 35.5 inches, and the entire area between the front wheelhouses shall be available for passengers and mobility aid devices.

VEHICLE PERFORMANCE

TS 7. Power Requirements

The propulsion system shall be sized to provide sufficient power to enable the bus to meet the defined acceleration, top speed, and gradability requirements, and operate all propulsion-driven accessories using actual road test results and computerized vehicle performance data.

TS 7.1 Top Speed

The bus shall be capable of achieving a speed of 45 mph but shall be governed at a top speed of 25 and 45 mph (some portion of buses will be required to only have a top speed of 25 mph) on a straight, level road at GVWR with all accessories operating. An alarm shall sound for speeds over 5 mph under the top governed speed. The top speed shall be adjustable by DPW.

NOTE: Values are assumed to be sustained. Manufacturer shall supply the GVI with data if there is a variance between peak performance and sustained vehicle performance.

TS 7.2 Gradability

Gradability requirements shall be met on grades with a dry commercial asphalt or concrete pavement at GVWR with all accessories operating.

NOTE: Values are assumed to be sustained. Manufacturer shall supply the GVI with data if there is a variance between peak performance and sustained vehicle performance.

The power plant shall enable the bus to maintain a speed of 40 mph on a 2 ½% grade, 20 mph on a 10% grade, and 15 mph on a 24% grade. The bus shall be able to accelerate from 0 to 10 mph on a 24% grade in 10 seconds.

There are eight bus routes on St. Thomas, many of which have dramatic changes in elevation over very short distances. For example, on St. Thomas near Bordeaux, a 1,250-foot elevation changes 120 feet for a 16% grade; near Adelphi a 1,500-foot elevation changes 360 feet for a grade of 24%. Other grades on the west end of St. Thomas are 8%. Near Estate Thomas there is a 1,000 foot section that rises 120 feet for a 12% grade. Near Mt. Zion, in 700 feet the elevation changes 80 feet for a 10% grade. At East End, the

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worse grade is 16% for 750 feet, and in other areas the grades are 8%. Buses are required to stop, pick up passengers and continue on even the steepest grades.

There is one bus route on St. John, and it has the most severe operation of all the islands. The roads have very steep grades with changes in elevation varying, with the worst case being a 40 foot change in elevation within 125 feet which results in a 32% grade. Another area rises 160 feet in 750 feet or a 21% grade. Most other grades are from 16% to 11%, but this is on a large portion of the roads.

There are five routes on St. Croix, where the operating conditions are the least severe of the three islands. The terrain is relatively flat with only a few areas where the buses have to climb grades which are not very steep. Elevations go up to 280 feet, but are gradual – averaging roughly 8%.

(Information on grades was taken from U.S. Geological Survey (USGS) maps as reported in 2000.)

TS 7.3 Acceleration

The acceleration shall meet the requirements below and shall be sufficiently gradual and smooth to prevent throwing standing passengers off-balance. Acceleration measurement shall commence when the accelerator is depressed.

TABLE 3
Maximum Start Acceleration Times on a Level Surface¹

Speed (mph)	Maximum time (seconds)
10	5
20	10
30	18
40	30

1. Vehicle weight = GVWR

TS 7.4 Operating Range

The operating range of the coach shall be designed to meet the operating profile as stated in the “Design Operating Profile” section.

TS 7.4.1 Diesel

The operating range of the coach run on the design operating profile shall be at least 250 miles with full fuel capacity.

TS 7.4.2 CNG - not used

TS 7.4.3 Hybrid – not used

TS 8. Fuel Economy

Test results from the Altoona fuel economy tests or other applicable test procedures shall be provided to the GVI. Results shall include vehicle configuration and test environment information. Fuel economy data shall be provided for each design operating profile. The design operating profile is assumed to be defined by the Altoona fuel duty cycle.

The engine shall be tuned when delivered to provide optimized performance as specified above, including fuel economy. All related components and configuration that affect fuel economy, such as, fan control/operation, transmission, axle ratio, etc., shall be selected accordingly. The bus shall achieve an average fuel economy of at least 4.00 miles per gallon when run on the Transit Coach Duty Cycle loaded to SLW. Reference SAE J1376, Fuel Economy Measurement Test (Engineering Type) for Trucks and Buses.

TS 8.1 Hybrid – not used

POWERPLANT

TS 9. Engine

The engine shall comply with applicable local, state, and/or federal emissions and useful life requirements.

The heavy duty diesel engine shall be designed to operate for not less than 300,000 miles without major failure or significant deterioration. The engine shall have sufficient torque to meet the gradability requirements of the Technical Specifications. The engine shall be rear mounted.

Components of the fuel management and/or control system shall have a design life of not less than 150,000 miles without replacement or major service. The lifetime estimate is based on the design operating profile.

The engine shall be equipped with an electronically controlled management system, compatible with either 12- or 24-volt power distribution. The engine control system shall be capable of transmitting and receiving electronic inputs and data from other drivetrain components and broadcasting that data to other vehicle systems. Communication between electronic drivetrain components and other vehicle systems shall be made using the communications networks. The engine's electronic management system shall monitor operating conditions and provide instantaneous adjustments to optimize both engine and bus performance. The system shall be programmable to allow optimization of programmable features.

The engine starting system shall be protected by an interlock that prevents its engagement when the engine is running. The integration of all systems on the vehicle relative to engine idle speed shall be the responsibility of the vehicle manufacturer to meet the requirements of the transit property.

The engine shall meet all requirements of the Technical Specifications when operating on No. 1 or 2 diesel fuel, as certified by the engine manufacturer and specified by the GVI. Durability of the engine and its components shall not be seriously reduced and exhaust emissions requirements shall be met by operation on either of the commercially available diesel fuels. Biodiesel fuel may be used in accordance with the engine manufacturer's recommendations.

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In order to avoid potential warranty disputes during the engine warranty period, initial performance settings shall only be changed with the authorization from the bus and engine manufacturers.

The engine shall have on-board diagnostic capabilities, able to monitor vital functions, store out-of-parameter conditions in memory, and communicate faults and vital conditions to service personnel. Diagnostic reader device connector ports, suitably protected against dirt and moisture, shall be provided in driver's area and near or inside engine compartment. The on-board diagnostic system shall inform the driver via visual and/or audible alarms when out-of-parameter conditions exist for vital engine functions.

In order to improve vehicle braking performance and extend brake life while operating on the steep grades in the Virgin Islands, the engine shall be equipped with an engine exhaust brake to reduce wear on the foundation brake system.

Engine brake design shall be approved by the engine manufacturer. Noise from the engine brake shall be minimized. The bus shall meet noise specifications while the engine brake is operating.

The engine shall be equipped with a driver-controlled fast idle device. The fast idle control shall be a two-way toggle mounted on the dash or side console and shall activate only with the transmission in neutral and the parking brake applied.

The engine control system shall protect the engine against progressive damage. The system shall monitor conditions critical for safe operation and automatically derate power and/or speed and initiate engine shutdown as needed. The on-board diagnostic system shall trigger a visual and audible alarm to the operator when the engine control unit detects a malfunction and the engine protection system is activated.

Automatic shutdown shall only occur when parameters established for the functions below are exceeded:

Coolant Level (if in list for automatic shutdown shall be designed that shut down will occur only before coolant will overheat)

Coolant Temperature

Oil Pressure

Oil Temperature

Automatic Engine Protection/Shutdown Override Feature

A control shall be available to the operator/driver that when constantly depressed and released will delay the engine shutdown or allow the bus to be moved. Override action shall be recorded. This data shall be retrievable by the GVI.

TS 9.1 Engine (CNG) – not used

TS 9.2 Propulsion System (Hybrid) – not used

TS 10. Cooling Systems

The cooling systems shall be of sufficient size to maintain all engine and transmission fluids and engine intake air at safe, continuous operating temperatures during the most severe operations possible and in accordance with engine and transmission manufacturers' cooling system requirements. The cooling

system fan controls should sense the temperatures of the operating fluids and the intake air, and if either is above safe operating conditions the cooling fan should be engaged. The fan control system shall be designed with a fail-safe mode of “fan on.” The cooling system shall meet the requirements stated in the operating environment.

TS 10.1 Engine Cooling

A means of determining satisfactory engine coolant level shall be provided. A spring-loaded, push-button type valve or lever shall be provided to safely release pressure or vacuum in the cooling system with both it and the water filler no more than 60 inches above the ground. Both shall be accessible through the same access door.

The radiator and charge air cooler shall be of durable, corrosion-resistant construction with non-removable tanks.

There shall be no screen in front of the radiator.

Standard Requirement for Coolant Filtration

The engine cooling system shall be equipped with a properly sized water filter with a spin-on element and an automatic system for releasing supplemental coolant additives as needed to replenish and maintain protection properties. When replacing the water filter, only the water in the filter will be lost.

Standard Control and Drive Design

Control and drive of the radiator and charge air cooler fan(s) shall be the Contractor’s standard design.

Standard Mounting Design

Mounting location of radiator and charge air cooler shall be the Contractor’s standard design.

Cooling Fan Controls

The cooling fan shall be temperature controlled, allowing the engine to reach operating temperature quickly.

TS 10.2 Charge Air Cooling

The charge air cooling system also referred to as after-coolers or inter-coolers shall provide maximum air intake temperature reduction with minimal pressure loss. The charge air radiator shall be sized and positioned to meet engine manufacturer’s requirements. The charge air radiator shall not be stacked ahead of or behind the engine radiator and shall be positioned as close to the engine as possible unless integrated with the radiator. Air ducting and fittings shall be protected against heat sources and shall be configured to minimize restrictions and maintain sealing integrity.

TS 10.3 Transmission Cooling

The transmission shall be cooled by a dedicated heat exchanger sized to maintain operating fluid within the transmission manufacturer’s recommended parameters of flow, pressure and temperature.. The transmission cooling system shall be matched to the engine cooling system to ensure that all operating fluids remain within recommended temperature limits established by each component manufacturer. The engine cooling system should provide coolant bypass flow to the transmission cooling system with the engine thermostats closed.

TS 10.4 Hybrid Drive System Cooling – not used

TS 11. Transmission (Conventional Powertrain)

The transmission shall be multiple speed, automatic shift with torque converter and electronic controls. Gross input power, gross input torque and rated input speed shall be compatible with the engine. The transmission shall be designed to operate for not less than 300,000 miles on the design operating profile without replacement or major service. The transmission should be easily removable without disturbing the engine and accessible for service.

The electronic controls shall be capable of transmitting and receiving electronic inputs and data from other drivetrain components and broadcasting that data to other vehicle systems. Communication between electronic drivetrain components and other vehicle systems shall be made using the communications networks. Electronic controls shall be compatible with either 12- or 24-volt power distribution, provide consistent shift quality and compensate for changing conditions such as variations in vehicle weight and engine power.

A nominal brake pedal application of 6 to 10 psi shall be required by the driver to engage forward or reverse range from the neutral position to prevent sudden acceleration of the bus from a parked position.

The electronically controlled transmission shall have on-board diagnostic capabilities, be able to monitor functions, store and time stamp out-of-parameter conditions in memory, and communicate faults and vital conditions to service personnel. The transmission shall contain built-in protection software to guard against severe damage. The on-board diagnostic system shall trigger a visual alarm to the driver when the electronic control unit detects a malfunction.

An electronic transmission fluid level monitoring and protection system shall be provided.

The transmission shall not incorporate an automatic neutral shift function.

TS 12. Retarder

The transmission shall not be equipped with a retarder.

TS 13. Mounting

The engine shall be rear mounted.

All powerplant mounting shall be mechanically isolated to minimize transfer of vibration to the body structure and provide a minimum clearance of 0.75 inches. Mounts shall control the movement of the powerplant so as not to affect performance of belt-driven accessories or cause strain in piping and wiring connections to the powerplant.

TS 13.1 Service

The propulsion system shall be arranged for ease of access and maintenance. The Contractor shall list all special tools, fixtures or facility requirements recommended for servicing. The muffler, exhaust system, air cleaner, air compressor, starter, alternator, radiator, all accessories and any other component requiring service or replacement shall be easily removable and independent of the engine and transmission removal.

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An engine oil pressure gauge and coolant temperature gauge shall be provided in the engine compartment. These gauges shall be easily read during service and mounted in an area where they shall not be damaged during minor or major repairs.

Engine oil and the radiator filler caps shall be hinged to the filler neck and closed with spring pressure or positive locks to prevent leakage. All fluid fill locations shall be properly labeled to help ensure that correct fluid is added. All fillers shall be easily accessible with standard funnels, pour spouts and automatic dispensing equipment. All lubricant sumps shall be fitted with magnetic-type drain plugs.

The engine and transmission shall be equipped with sufficient heavy-duty fuel and oil filters for efficient operation and to protect the engine and transmission between scheduled filter changes. All filters shall be easily accessible and the filter bases shall be plumbed to ensure correct reinstallation.

An air cleaner with a dry filter element and a graduated air filter restriction indicator shall be provided. The location of the air intake system shall be designed to minimize the entry of dust and debris and to maximize the life of the air filter. The engine air duct shall be designed to minimize the entry of water into the air intake system. Drainage provisions shall be included to allow any water/moisture to drain prior to entry into air filter.

Engine-driven accessories shall be mounted for quick removal and repair. Accessory drive systems shall operate without unscheduled adjustment for not less than 50,000 miles on the Design Operating Profile. These accessories shall be driven at speeds sufficient to assure adequate system performance during extended periods of idle operation and low route speed portion of the design operating profile. Belt guards shall be provided as required for safety and shall be sturdy in design and installation and be hinged or designed to be automatically moved out of the way and still be attached to the bus for engine access.
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TS 14. Hydraulic Systems

Hydraulic system service tasks shall be minimized and scheduled no more frequently than those of other major coach systems. All elements of the hydraulic system shall be easily accessible for service or unit replacement. Critical points in the hydraulic system shall be fitted with service ports so that portable diagnostic equipment may be connected or sensors for an off-board diagnostic system permanently attached to monitor system operation when applicable. A tamper-proof priority system shall prevent the loss of power steering during operation of the bus if other devices are also powered by the hydraulic system.

The hydraulic system shall operate within the allowable temperature range as specified by the lubricant manufacturer.

TS 14.1 Fluid Lines

All lines shall be rigidly supported to prevent chafing damage, fatigue failures, degradation and tension strain. Lines should be sufficiently flexible to minimize mechanical loads on the components. Lines passing through a panel, frame or bulkhead shall be protected by grommets (or similar devices) that fit snugly to both the line and the perimeter of the hole that the line passes through to prevent chafing and wear. Pipes and fluid hoses shall not be bundled with or used to support electrical wire harnesses.

Lines shall be as short as practicable and shall be routed or shielded so that failure of a line shall not allow the contents to spray or drain onto any component operable above the auto-ignition temperature of the fluid.

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All hoses, pipes, lines and fittings shall be specified and installed per the manufacturer's recommendations.

Flexible lines shall be Teflon hoses with braided stainless steel jackets except in applications where premium hoses are required and shall have standard SAE or JIC brass or steel, swivel, end fittings. Flexible hoses over 1 inch in diameter need not be Teflon with braided stainless steel jacket but shall be in conformance with SAE Standard J100R5. Flexible hoses and fluid lines shall not touch one another, or any part of the bus.

TS 14.2 Fittings and Clamps

All clamps shall maintain a constant tension at all times, expanding and contracting with the line in response to temperature changes and aging of the line material. The lines shall be designed for use in the environment where they are installed. For example, high-temperature resistant in the engine compartment, resistant to road salts near the road surface, and so on.

Compression fittings shall be standardized to prevent the intermixing of components. Compression fitting components from more than one manufacturer shall not be mixed, even if the components are known to be interchangeable.

TS 14.3 Charge Air Piping

Charge air piping and fittings shall be designed to minimize air restrictions and leaks. Piping shall be as short as possible, and the number of bends shall be minimized. Bend radii shall be maximized to meet the pressure drop and temperature rise requirements of the engine manufacturer. The cross-section of all charge air piping shall not be less than the cross-section of the intake manifold inlet. Any changes in pipe diameter shall be gradual to ensure a smooth passage of air and to minimize restrictions. Piping shall be routed away from heat sources as practicable and shielded as required to meet the temperature rise requirements of the engine manufacturer.

Charge air piping shall be constructed of stainless steel, aluminized steel or anodized aluminum, except between the air filter and turbocharger inlet, where piping may be constructed of fiberglass. Connections between all charge air piping sections shall be sealed with a short section of reinforced hose and secured with stainless steel constant tension clamps that provide a complete 360-degree seal.

TS 15. Radiator

Radiator piping shall be stainless steel or brass tubing, and if practicable, hoses shall be eliminated. Necessary hoses shall be premium silicone rubber type impervious to all bus fluids. All hoses shall be secured with stainless steel clamps that provide a complete 360-degree seal. The clamps shall maintain a constant tension at all times, expanding and contracting with the hose in response to temperature changes and aging of the hose material.

TS 16. Oil and Hydraulic Lines

Oil and hydraulic lines shall be compatible with the substances they carry. The lines shall be designed and intended for use in the environment where they are installed. For example, high-temperature resistant in the engine compartment, resistant to road salts near the road surface, and so on. Lines within the engine compartment shall be composed of steel tubing where practicable, except in locations where flexible lines are required.

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Hydraulic lines of the same size and with the same fittings as those on other piping systems of the bus, but not interchangeable, shall be tagged or marked for use on the hydraulic system only.

TS 17. Fuel

TS 17.1 Fuel Lines

Fuel lines shall be securely mounted, braced and supported as designed by the bus manufacturer to minimize vibration and chafing and shall be protected against damage, corrosion or breakage due to strain or wear.

Manifolds connecting fuel containers shall be designed and fabricated to minimize vibration and shall be installed in protected locations to prevent line or manifold damage from unsecured objects or road debris.

Fuel hose and hose connections, where permitted, shall be made from materials resistant to corrosion and fuel and protected from fretting and high heat. Fuel hoses shall be accessible for ease of serviceability.

Fuel Lines, Diesel

Fuel lines shall be capable of carrying the type of fuel specified by the GVI (i.e., up to B20 type fuel).

Fuel Lines, CNG – not used

TS 17.2 Design and Construction

TS 17.2.1 Design and Construction, Diesel

Fuel Tank(s)

The fuel tank shall have a total minimum capacity of 100 gallons.

The fuel tank(s) shall be made of corrosion resistant material.

Installation

The fuel tank(s) shall be securely mounted to the bus to prevent movement during bus maneuvers.

The fuel tank(s) shall be equipped with an external, hex head, drain plug. It shall be at least a 3/8-inch size and shall be located at the lowest point of the tank(s). The fuel tank(s) shall have an inspection plate or easily removable filler neck to permit cleaning and inspection of the tank(s) without removal from the bus. The tank(s) shall be baffled internally to prevent fuel-sloshing noise regardless of fill level. The baffles or fuel pickup location shall assure continuous full power operation on a 6 percent upgrade for 15 minutes starting with no more than 25 gallons of fuel over the unusable amount in the tank(s). The bus shall operate at idle on a 6 percent downgrade for 30 minutes starting with no more than 10 gallons of fuel over the unusable amount in the tank(s).

The materials used in mounting shall withstand the adverse effects of the U.S. Virgin Islands operating environment and of fuel oils for the life of the bus.

Labeling

The capacity, date of manufacture, manufacturer name, location of manufacture, and certification of compliance to Federal Motor Carrier Safety Regulation shall be permanently marked on the fuel tank(s). The markings shall be readily visible and shall not be covered with an undercoating material.

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Fuel Filler

The fuel filler shall be located 7 to 25 feet behind the centerline of the front door on the streetside (right side) of the bus.

The filler cap shall be retained to prevent loss and shall be recessed into the body so that spilled fuel will not run onto the outside surface of the bus.

The fuel lines forward of the engine bulkhead shall be in conformance to SAE Standards.

The fuel filler shall accommodate a standard 1½ inch fuel nozzle and fill rate of not less than 40 gallons per minute of foam-free fuel without spitting back or causing the nozzle to shut off before the tank is full. The nozzle shall automatically shut off when the tank is essentially full. An audible signal shall indicate when the tank is essentially full.

TS 17.2.1 Design and Construction, CNG – not used

TS 18. Emissions and Exhaust

TS 18.1 Exhaust Emissions

The engine and related systems shall meet all applicable emission and engine design guidelines and standards.

TS 18.2 Exhaust System

Exhaust gases and waste heat shall be discharged from the rear corner of the roof.

The exhaust pipe shall be of sufficient height to prevent exhaust gases and waste heat from discoloring or causing heat deformation to the bus. The entire exhaust system shall be adequately shielded to prevent heat damage to any bus component, including the exhaust after-treatment compartment area. The exhaust outlet shall be designed to minimize rain or water generated from high-pressure washing systems from entering into the exhaust pipe and causing damage to the after-treatment.

TS 18.3 Exhaust Aftertreatment

An exhaust aftertreatment system will be provided to ensure compliance to all applicable Environmental Protection Agency (EPA) regulations in effect.

Diesel Exhaust Fluid (DEF) Injection

If required by the engine manufacturer to meet Nitrogen Oxide (NOx) level requirements specified by EPA, a DEF injection system will be provided. The DEF system will minimally include a tank, an injector, a pump, an Engine Control Module (ECM) and a selective catalytic converter. The tanks shall be designed to store DEF in the operating environment described in the “Operating Environment” section.

TS 18.4 Particulate Aftertreatment

If required by the engine manufacturer to meet particulate level requirements specified by EPA, a particulate trap will be provided. The particulate trap shall regenerate itself automatically if it senses clogging. Regeneration cycles and conditions will be defined by the engine manufacturer.

STRUCTURE

TS 19. General

TS 19.1 Design

The structure of the bus shall be designed to withstand the transit service conditions typical of an urban duty cycle throughout its service life. The vehicle structural frame shall be designed to operate with minimal maintenance throughout the 12-year design operating profile. The design operating profile specified by the GVI shall be considered for this purpose.

The vehicle shall be constructed using only inherently corrosion-resistant materials and fasteners to minimize deterioration. The structure shall not require corrosion-preventive coatings or after-treatments either during construction or through the service life of the vehicle.

TS 20. Altoona Testing

Prior to acceptance of first bus, the vehicle must have completed any Federal Transit Administration (FTA)-required Altoona testing. Any items that required repeated repairs or replacement must undergo the corrective action with supporting test and analysis. A report clearly describing and explaining the failures and corrective actions taken to ensure any and all such failures will not occur shall be submitted to the GVI.

Altoona Test Report Provided to the GVI Prior to Start of Bus Production

Prior to the start of any bus manufacturing or assembly processes, the structure of the proposed bus model shall have undergone appropriate structural testing and/or analysis, including the complete regimen of FTA required Altoona tests. Prior to assembly of the first bus, the original equipment manufacturer (OEM) shall provide the GVI with a completed report of Altoona testing for the proposed bus model along with a plan of corrective action to address deficiencies, breakdowns and other issues identified during Altoona testing. The bus model tested shall match the bus model proposed for procurement, including structure, axles and drive-train. Base model and partial Altoona test reports are acceptable when the combination of these tests adequately represents the proposed bus model.

TS 20.1 Structural Validation

Baseline Structural Analysis

The structure of the bus shall have undergone appropriate structural testing and/or analysis. At minimum, appropriate structural testing and analysis shall include Altoona testing or Finite Element Analysis (FEA).

TS 21 Distortion

The bus, loaded to GVWR and under static conditions, shall not exhibit deflection or deformation that impairs the operation of the steering mechanism, doors, windows, passenger escape mechanisms or service doors. Static conditions shall include the vehicle at rest with any one wheel or dual set of wheels on a 6 inch curb or in a 6 inch deep hole.

TS 22 Resonance and Vibration

All structure, body and panel-bending mode frequencies, including vertical, lateral and torsional modes, shall be sufficiently removed from all primary excitation frequencies to minimize audible, visible or sensible resonant vibrations during normal service.

TS 22.1 Engine Compartment Bulkheads

The passenger and engine compartment shall be separated by fire-resistant bulkheads. The engine compartment shall include areas where the engine and exhaust system are housed. This bulkhead shall preclude or retard propagation of an engine compartment fire into the passenger compartment and shall be in accordance with the Recommended Fire Safety Practices defined in FTA Docket 90A, dated October 20, 1993. Only necessary openings shall be allowed in the bulkhead, and these shall be fire-resistant. Any passageways for the climate control system air shall be separated from the engine compartment by fire-resistant material. Piping through the bulkhead shall have fire-resistant fittings sealed at the bulkhead. Wiring may pass through the bulkhead only if connectors or other means are provided to prevent or retard fire propagation through the bulkhead. Engine access panels in the bulkhead shall be fabricated of fire-resistant material and secured with fire-resistant fasteners. These panels, their fasteners and the bulkhead shall be constructed and reinforced to minimize warping of the panels during a fire that will compromise the integrity of the bulkhead.

TS 22.2 Crashworthiness

The bus body and roof structure shall withstand a static load equal to 150 percent of the curb weight evenly distributed on the roof with no more than a 6-inch reduction in any interior dimension. Windows shall remain in place and shall not open under such a load. These requirements must be met without the roof-mounted equipment installed.

The bus shall withstand a 25 mph impact by a 4000-pound automobile at any side, excluding doorways, along either side of the bus with no more than 3 inches of permanent structural deformation at seated passenger hip height. This impact shall not result in sharp edges or protrusions in the bus interior.

Exterior panels below 35 inches from ground level shall withstand a static load of 2000 lbs applied perpendicular to the bus by a pad no larger than 5 square inches. This load shall not result in deformation that prevents installation of new exterior panels to restore the original appearance of the bus.

TS 23. Corrosion

The bus flooring, sides, roof, understructure and axle suspension components shall be designed to resist corrosion or deterioration from atmospheric conditions and salt-blast cleaning materials for a period of 12 years or 500,000 miles, whichever comes first. It shall maintain structural integrity and nearly maintain original appearance throughout its service life, with the GVI' use of proper cleaning and neutralizing agents.

All materials that are not inherently corrosion resistant shall be protected with corrosion-resistant coatings. All joints and connections of dissimilar metals shall be corrosion resistant and shall be protected from galvanic corrosion. Representative samples of all materials and connections shall withstand a two-week (336-hour) salt spray test in accordance with ASTM International (ASTM) Procedure B-117 with no structural detrimental effects to normally visible surfaces and no weight loss of over 1 percent.

Additional Corrosion Resistance Requirements

The vehicle shall be constructed using only inherently corrosion-resistant materials and fasteners such as stainless steel or composites to minimize deterioration. The structure shall not require corrosion-

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preventive coatings or after-treatments, either during construction or throughout the service life of the vehicle.

TS 24. Towing

Each towing device shall withstand, without permanent deformation, tension loads up to 1.2 times the curb weight of the bus within 20 degrees of the longitudinal axis of the bus. If applicable, the rear towing device(s) shall not provide a toehold for unauthorized riders. The method of attaching the towing device shall not require the removal, or disconnection, of front suspension or steering components.

A plug connector permanently mounted at the front of the bus shall provide for bus tail lamp, marker, stop and turn signal lamp operation as controlled from the towing vehicle. The connector shall include a spring-loaded dust- and water-resistant cap. Shop air connectors shall be provided at the front and rear of the bus and shall be capable of supplying all pneumatic systems of the bus with externally sourced compressed air. The location of these shop air connectors shall facilitate towing operations.

Lifted (Unsupported) Front Axle and Flat Towing Capability

The front towing devices shall allow attachment of adapters for a rigid tow bar and shall permit the lifting and towing of the bus, at curb weight, while the front wheels are clear off the ground. These devices shall also permit common flat towing.

Two rear recovery devices/tie downs shall permit lifting and towing of the bus for a short distance, such as in cases of an emergency, to allow access to provisions for front towing of bus. The method of attaching the tow bar or adapter shall require the specific approval of the GVI. Any tow bar or adapter exceeding 50 lbs should have means to maneuver or allow for ease of use and application. Each towing device shall accommodate a crane hook with a 1 inch throat. Towing procedures shall be included in the maintenance manual.

TS 25. Jacking

It shall be possible to safely jack up the bus, at curb weight, with a common 10-ton floor jack with or without special adapter, when a tire or dual set is completely flat and the bus is on a level, hard surface, without crawling under any portion of the bus. Jacking from a single point shall permit raising the bus sufficiently high to remove and reinstall a wheel and tire assembly. Jacking pads located on the axle or suspension near the wheels shall permit easy and safe jacking with the flat tire or dual set on a 6 inch high run-up block not wider than a single tire. The bus shall withstand such jacking at any one or any combination of wheel locations without permanent deformation or damage.

Jacking pads shall be painted safety yellow.

TS 26. Hoisting

The bus axles or jacking plates shall accommodate the lifting pads of a two-post hoist system. Jacking plates, if used as hoisting pads, shall be designed to prevent the bus from falling off the hoist. Other pads or the bus structure shall support the bus on jack stands independent of the hoist.

TS 27. Floor

TS 27.1 Design

The floor shall be essentially a continuous plane, except at the wheel housings and platforms and as specified under Bi-Level Floor Design (Low-Floor). Where the floor meets the walls of the bus, as well as other vertical surfaces such as platform risers, the surface edges shall be blended with a circular section of radius not less than ¼ inch or installed in a fully sealed butt joint. Similarly, a molding or cover shall prevent debris accumulation between the floor and wheel housings. The vehicle floor in the area of the entrance and exit doors shall have a lateral slope not exceeding 2 degrees to allow for drainage.

Bi-Level Floor Design (Low-Floor)

The low-floor design shall consist of two levels (bi-level construction). Aft of the rear door extending to the rear settee riser, the floor height may be raised to a height no more than 21 inches above the lower level, with equally spaced steps. An increase slope shall be allowed on the upper level, not to exceed 3.5 degrees off the horizontal.

TS 27.2 Strength

The floor deck may be integral with the basic structure or mounted on the structure securely to prevent chafing or horizontal movement and designed to last the life of the bus. Sheet metal screws shall not be used to retain the floor, and all floor fasteners shall be serviceable from one side only. Any adhesives, bolts or screws used to secure the floor to the structure shall last and remain effective throughout the life of the coach. Tapping plates, if used for the floor fasteners, shall be no less than the same thickness as a standard nut, and all floor fasteners shall be secured and protected from corrosion for the service life of the bus.

The floor deck shall be reinforced as needed to support passenger loads. At GVWR, the floor shall have an elastic deflection of no more than 0.60 inches from the normal plane. The floor shall withstand the application of 2.5 times gross load weight without permanent detrimental deformation. The floor, with coverings applied, shall withstand a static load of at least 150 lbs applied through the flat end of a one-half-inch diameter rod, with 1/32-inch radius, without permanent visible deformation.

TS 27.3 Construction

The floor shall consist of the subfloor and the floor covering that will last the life of the bus. The floor as assembled, including the sealer, attachments and covering, shall be waterproof, non-hygroscopic and resistant to mold growth. The subfloor shall be resistant to the effects of moisture, including decay (dry rot). It shall be impervious to wood-destroying insects such as termites.

Pressure-Preserved Plywood Panel

Plywood shall be certified at the time of manufacturing by an industry-approved third-party inspection agency such as APA – The Engineered Wood Association (formerly the American Plywood Association). Plywood shall be of a thickness adequate to support design loads, manufactured with exterior glue, satisfy the requirements of a Group I Western panel as defined in PS 1-95 (Voluntary Product Standard PS 1-95, “Construction and Industrial Plywood”) and be of a grade that is manufactured with a solid face and back. Plywood shall be installed with the highest-grade, veneer side up. Plywood shall be pressure-treated with a preservative chemical and process such as alkaline copper quaternary (ACQ) that prevents decay and damage by insects. Preservative treatments shall utilize no EPA-listed hazardous chemicals. The concentration of preservative chemicals shall be equal to or greater than required for an above ground level application. Treated plywood will be certified for preservative penetration and retention by a third

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party inspection agency. Pressure-preservative treated plywood shall have a moisture content at or below 15 percent.

A barrier shall be installed to prevent contact by salt laden air with the plywood panels.

TS 28.Platforms

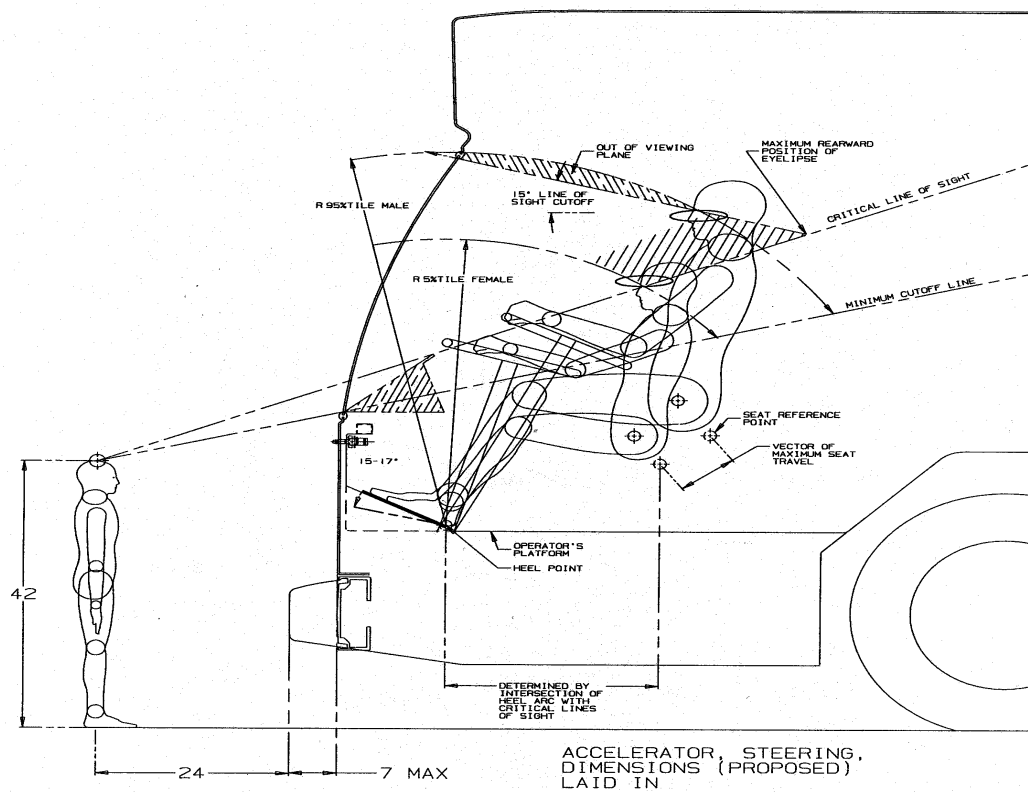
TS 28.1 Driver's Area

The covering of platform surfaces and risers, except where otherwise indicated, shall be the same material as specified for floor covering. Trim shall be provided along top edges of platforms unless integral nosing is provided.

TS 28.2 Driver's Platform

The driver's platform shall be of a height such that, in a seated position, the driver can see an object located at an elevation of 42 inches above the road surface, 24 inches from the leading edge of the bumper. Notwithstanding this requirement, the platform height shall not position the driver such that the driver's vertical upward view is less than 15 degrees. A warning decal or sign shall be provided to alert the driver to the change in floor level. Figure 3 illustrates a means by which the platform height can be determined, using the critical line of sight.

FIGURE 3
Determining Platform Height



TS 28.3 Farebox

Farebox placement should minimize impact to passenger access and minimize interference with the driver's line of sight.

Driver Interface Required; Platform Needed to Bring Height to Driver Access

If the driver's platform is higher than 12 inches, then the farebox is to be mounted on a platform of suitable height to provide accessibility for the driver without compromising passengers' access.

Refer to Section TS 74, Fare Collection, for requirements.
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TS 28.4 Rear Step Area to Rear Area

If the vehicle is of a bi-level floor design, a rear step area shall be provided along the center aisle of the bus to facilitate passenger traffic between the upper and lower floor levels. This step area shall be cut into the rear platform and shall be approximately the aisle width, a minimum 12 inches deep and approximately half the height of the upper level relative to the lower level. The horizontal surface of this platform shall be covered with skid-resistant material with a visually contrasting nosing and shall be sloped slightly for drainage. A warning decal or sign shall be provided at the immediate platform area to alert passengers to the change in floor level.

TS 28.5 Stepwells

Design

Risers shall be continuous, flat, planes across the entire width of the stepwell except for notches which shall not be larger than necessary to accommodate inward opening door panels. Step risers may be inclined, not to exceed 10 degrees, from the vertical with only the lower edge inward.

All step treads shall be designed for uniform depth within standard manufacturing tolerance and which shall be no less than 11 inches and the plane of the step treads shall be parallel to the plane of the floor. Treads shall be covered with 5/16-inch, nonskid, ribbed, composition-rubber material that shall remain effective in all weather conditions. Color of the tread covering shall match the vestibule flooring. The edge of the vestibule floor shall conform to ADA requirements and shall have a maximum 5/16-inch overhang at the step riser. The edge of the vestibule floor and the end of the step tread shall have a bright, contrasting band, such as white or yellow, no less than 2 inches wide on the full width of the step. The color shall be permanently blended into the tread covering material.

Structure

Stepwells shall be constructed of stainless steel and shall be corrosion-resistant throughout the service life of the bus.
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The following requirements are not applicable to steps that are reconfigured to provide a wheelchair lift platform.

The steps shall simultaneously support 300-pound loads evenly distributed over the center half of each step tread without permanent deformation and with elastic deflection of no more than 0.125 inches. Each step tread shall support a load of 500 pounds evenly distributed over the center half of the tread without permanent deformation. The steps shall be sloped ½ to 2 degrees to preclude water accumulation in the stepwells. All intersections of the step tread and riser in the stepwell shall have radii no less than ½ inch.

TS 29. Wheel Housing

TS 29.1 Design and Construction

Sufficient clearance and air circulation shall be provided around the tires, wheels and brakes to preclude overheating when the bus is operating on the design operating profile.

Wheel housings shall be constructed of stainless steel and corrosion-resistant and fire-resistant material.

Interference between the tires and any portion of the bus shall not be possible in maneuvers up to the limit of tire adhesion with weights from curb weight to GVWR. Wheel housings shall be adequately reinforced where seat pedestals are installed. Wheel housings shall have sufficient sound insulation to minimize tire and road noise and meet all noise requirements of this specification.

Design and construction of front wheel housings shall allow for the installation of a radio or electronic equipment storage compartment on the interior top surface, or its use as a luggage rack (low-floor bus).

The finish of the front wheel housings shall be scratch-resistant and complement interior finishes of the bus to minimize the visual impact of the wheel housing. If fiberglass wheel housings are provided, then they shall be color-impregnated to match interior finishes. The lower portion extending to approximately 10 to 12 inches above floor shall be equipped with scuff-resistant coating or stainless steel trim.

Wheel housings, as installed and trimmed, shall withstand impacts of a two-inch steel ball with at least 200 ft-lbs of energy without penetration.

Wheel housings not equipped with seats or equipment enclosure shall have a horizontal assist mounted on the top portion of the housing no more than 4 inches higher than the wheel well housing.

TS 29.2 Articulated Joint – not used

TS 29.3 Raceway – not used

TS 29.4 Bellows – not used

CHASSIS

TS 30. Suspension

TS 30.1 General Requirements

Both the front and rear suspensions shall be pneumatic type. The basic suspension system shall last the service life of the bus without major overhaul or replacement. Adjustment points shall be minimized and shall not be subject to a loss of adjustment in service. Routine adjustments shall be easily accomplished by limiting the removal or disconnecting the components.

Normal replacement items, such as one suspension bushing, shock absorbers, or air spring shall be replaceable by a 3M mechanic in 30 minutes or less.

TS 30.2 Alignment

All axles should be properly aligned so the vehicle tracks accurately within the size and geometry of the vehicle.

TS 30.3 Springs and Shock Absorbers

TS 30.3.1 Suspension Travel

The suspension system shall permit a minimum wheel travel of 2.75-inch jounce-upward travel of a wheel when the bus hits a bump (higher than street surface), and 2.75-inch rebound-downward travel when the bus comes off a bump and the wheels fall relative to the body. Elastomeric bumpers shall be provided at the limit of jounce travel. Rebound travel may be limited by elastomeric bumpers or hydraulically within the shock absorbers. Suspensions shall incorporate appropriate devices for automatic height control so that regardless of load the bus height relative to the centerline of the wheels does not change more than one-half inch at any point from the height required. The safe operation of a bus cannot be impacted by ride height up to 1 inch from design normal ride height.

TS 30.3.2 Damping

Vertical damping of the suspension system shall be accomplished by hydraulic shock absorbers mounted to the suspension arms or axles and attached to an appropriate location on the chassis. Damping shall be sufficient to control coach motion to three cycles or less after hitting road perturbations. The shock absorber bushing shall be made of elastomeric material that will last the life of the shock absorber. The damper shall incorporate a secondary hydraulic rebound stop.

Shock absorbers shall maintain their effectiveness for at least 50,000 miles of the service life of the bus. Each unit shall be replaceable by a 2M mechanic in less than 15 minutes.

TS 30.3.3 Lubrication

Standard Grease Fittings

All elements of steering, suspension and drive systems requiring scheduled lubrication shall be provided with grease fittings conforming to SAE Standard J534. These fittings shall be located for ease of inspection and shall be accessible with a standard grease gun from a pit or with the bus on a hoist. Each element requiring lubrication shall have its own grease fitting with a relief path. The lubricant specified shall be standard for all elements on the bus serviced by standard fittings and shall be required no less than every 6000 miles.

TS 30.3.4 Kneeling

A kneeling system shall lower the entrance(s) of the bus a minimum of 2.5 inches during loading or unloading operations regardless of load up to GVWR, measured at the longitudinal centerline of the entrance door(s) by the driver. The kneeling control shall provide the following functions:

- Downward control must be held to allow downward kneeling movement.
- Release of the control during downward movement must completely stop the lowering motion and hold the height of the bus at that position.
- Upward control actuation must allow the bus to return to normal floor height without the driver having to hold the control.

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The brake and throttle interlock shall prevent movement when the bus is kneeled. The kneeling control shall be disabled when the bus is in motion. The bus shall kneel at a maximum rate of 1.25 inches per second at essentially a constant rate. After kneeling, the bus shall rise within 3 seconds to a height permitting the bus to resume service and shall rise to the correct operating height within 7 seconds regardless of load up to GVWR. During the lowering and raising operation, the maximum vertical acceleration shall not exceed 0.2g, and the jerk shall not exceed 0.3g/second.

An indicator visible to the driver shall be illuminated until the bus is raised to a height adequate for safe street travel. An audible warning alarm will sound simultaneously with the operation of the kneeler to alert passengers and bystanders. A warning light mounted near the curbside of the front door, a minimum 2.5-inch diameter amber lens, shall be provided that will blink when the kneel feature is activated. Kneeling shall not be operational while the wheelchair ramp is deployed or in operation.

TS 31. Wheels and Tires

TS 31.1 Wheels

All wheels shall be interchangeable and shall be removable without a puller. Wheels shall be compatible with tires in size and load-carrying capacity. Front wheels and tires shall be balanced as an assembly per SAE J1986.

Wheels and rims shall be hub-piloted brushed aluminum and shall resist rim flange wear.

TS 31.2 Tires

Tires shall be suitable for the conditions of transit service and sustained operation at the maximum speed capability of the bus. Load on any tire at GVWR shall not exceed the tire Supplier's rating.

The tires shall be supplied by the Contractor.
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TS 32. Steering

Hydraulically assisted steering shall be provided. The steering gear shall be an integral type with the number and length of flexible lines minimized or eliminated. Engine driven hydraulic pump shall be provided for power steering.

Fatigue life of all steering components shall exceed 1,000,000 miles. No element of the steering system shall sustain a Class I failure when one of the tires hits a curb or strikes a severe road hazard. Inadvertent alternations of steering as a result of striking road hazards are steering failures.

TS 32.1 Steering Axle

Oiled-Type Front Bearings

The front axle shall be non-driving with a load rating sufficient for the bus loaded to GVWR and shall be equipped with sealed, oiled-type front wheel bearings.
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All friction points on the front axle shall be equipped with replaceable bushings or inserts and, if needed, lubrication fittings easily accessible from a pit or hoist.

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The steering geometry of the outside (frontlock) wheel shall be within 2 degrees of true Ackerman up to 50 percent lock measured at the inside (backlock) wheel. The steering geometry shall be within 3 degrees of true Ackerman for the remaining 100 percent lock measured at the inside (backlock) wheel.

TS 32.2 Wheel

TS 32.2.1 Turning Effort

Steering effort shall be measured with the bus at GVWR, stopped with the brakes released and the engine at normal idling speed on clean, dry, level, commercial asphalt pavement and the tires inflated to recommended pressure.

Under these conditions, the torque required to turn the steering wheel 10 degrees shall be no less than 5 ft-lbs and no more than 10 ft-lbs. Steering torque may increase to 70 ft-lbs when the wheels are approaching the steering stops, as the relief valve activates.

Power steering failure shall not result in loss of steering control. With the bus in operation, the steering effort shall not exceed 55 lbs at the steering wheel rim, and perceived free play in the steering system shall not materially increase as a result of power assist failure. Gearing shall require no more than seven turns of the steering wheel lock-to-lock.

Caster angle shall be selected to provide a tendency for the return of the front wheels to the straight position with minimal assistance from the driver.

TS 32.2.2 Steering Wheel, General

The steering wheel diameter shall be no less than 20 inches and shall be removable with a standard or universal puller.

The rim diameter shall be $\frac{7}{8}$ inch to $1\frac{1}{4}$ inches and shaped for firm grip with comfort for long periods of time.

Steering wheel spokes and wheel thickness shall ensure visibility of the dashboard so that vital instrumentation is clearly visible at center neutral position (within the range of a 95th-percentile male, as described in SAE 1050a, Sections 4.2.2 and 4.2.3). Placement of steering column must be as far forward as possible, but either in line with or behind the instrument cluster.

TS 32.2.3 Steering Column Tilt

The steering column shall have full tilt capability with an adjustment range of no less than 40 degrees from the vertical and easily adjustable by the driver.

TS 32.2.4 Steering Wheel Telescopic Adjustment

The steering wheel shall have full telescoping capability and have a minimum telescopic range of 2 inches and a minimum low-end adjustment of 29 inches, measured from the top of the steering wheel rim in the horizontal position to the cab floor at the heel point.

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TABLE 4
Steering Wheel Height¹ Relative to Angle of Slope

At Minimum Telescopic Height Adjustment (29 inches)		At Maximum Telescopic Height Adjustment (5 inches)	
Angle of Slope	Height	Angle of Slope	Height
0 degrees	29 inches	0 degrees	34 inches
15 degrees	26.2 inches	15 degrees	31.2 inches
25 degrees	24.6 inches	25 degrees	29.6 inches
35 degrees	22.5 inches	35 degrees	27.5 inches

1. Measured from bottom portion closest to driver.

TS 33. Drive Axle

The choice of rear axle ratio shall be optimized to meet the severe gradability and reduced top speed requirements of the specifications.

The bus shall be driven by a heavy-duty axle with a load rating sufficient for the bus loaded to GVWR. The drive axle shall have a design life to operate for not less than 300,000 miles on the design operating profile without replacement or major repairs. The lubricant drain plug shall be magnetic type. If a planetary gear design is employed, the oil level in the planetary gears shall be easily checked through the plug or sight gauge. The axle and driveshaft components shall be rated for both propulsion and retardation modes with respect to duty cycle.

NOTE: The retardation duty cycle can be more aggressive than propulsion.

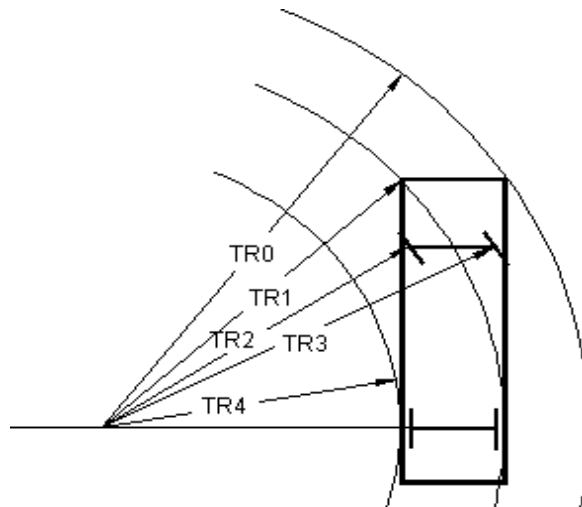
The drive shaft shall be guarded to prevent hitting any critical systems, including brake lines, coach floor or the ground, in the event of a tube or universal joint failure.

TS 33.1 Non-Drive Axle - not used

TS 34. Turning Radius

Dimension (see Figure 4)	Maximum Radius
Outside Corner (TR0)	32 feet

FIGURE 4
Turning Radius



TS 35. Brakes

TS 35.1 Service Brake

The service brake system shall be air drum brakes or air disc brakes or a combination, and shall be designed for high performance and long life on the U.S Virgin Islands design operating profile, including the steep grades described in TS 7.2 Gradability. The Contractor shall supply a copy of the FMVSS test report with the Proposal submittal. The entire service brake system, including friction material, shall have a minimum overhaul or replacement life of 30,000 miles on the design operating profile.

Brakes shall be self-adjusting. Brake wear indicators (visible brake sensors) shall be provided on exposed push rods.

TS 35.2 Actuation

Air-Actuated Brakes

Service brakes shall be controlled and actuated by a compressed air system. Force to activate the brake pedal control shall be an essentially linear function of the bus deceleration rate and shall not exceed 70 lbs at a point 7 inches above the heel point of the pedal to achieve maximum braking. The heel point is the location of the driver's heel when his or her foot is rested flat on the pedal and the heel is touching the floor or heel pad of the pedal. The electronic control unit (ECU) for the anti-lock brake system (ABS) shall be protected, yet in an accessible location to allow for ease of service.

The total braking effort shall be distributed between all wheels in such a ratio as to ensure equal friction material wear rate at all wheel locations. Manufacturer shall demonstrate compliance by providing a copy of a thermo dynamic brake balance test upon request.

Actuation of ABS shall override the operation of the engine brake.

TS 35.3 Friction Material

The brake linings shall be made of non-asbestos material. In order to aid maintenance personnel in determining extent of wear, a provision such as a scribe line or chamfer indicating the thickness at which replacement becomes necessary shall be provided on each brake lining. The complete brake lining wear indicator shall be clearly visible from the hoist or pit without removing backing plates.

TS 35.4 Hubs and Drums

Replaceable wheel bearing seals shall run on replaceable wear surfaces or be of an integral wear surface sealed design. Wheel bearing and hub seals and unitized hub assemblies shall not leak or weep lubricant when operating on the design operating profile for 100,000 miles.

The bus shall be equipped with brake drums or disc brakes or a combination. Brake drums shall allow machining for oversized linings per manufacturers specifications. Brake discs shall allow machining of each side of the disc to obtain smooth surfaces per manufacturer's specifications.

The brake system material and design shall be selected to absorb and dissipate heat quickly so that the heat generated during braking operation does not glaze brake linings.

The heat generated shall not increase the temperature of tire beads and wheel contact area to more than that allowed by the tire manufacturer.

TS 35.5 Parking/Emergency Brake

Air Brakes

The parking brake shall be a spring-operated system, actuated by a valve that exhausts compressed air to apply the brakes. The parking brake may be manually enabled when the air pressure is at the operating level per FMVSS 121.

Emergency Brake

An emergency brake release shall be provided to release the brakes in the event of automatic emergency brake application. The driver shall be able to manually depress and hold down the emergency brake release valve to release the brakes and maneuver the bus to safety. Once the driver releases the emergency brake release valve, the brakes shall engage to hold the bus in place.

TS 36 Interlocks

TS 36.1 Passenger Door Interlocks

To prevent opening rear passenger doors while the bus is in motion, a speed sensor shall be integrated with the door controls to prevent the rear doors from being enabled or opened unless the bus speed is less than 2 mph.

To preclude movement of the bus, an accelerator interlock shall lock the accelerator in the closed position, and a brake interlock shall engage the service brake system to stop movement of the bus when the driver's door control is moved to a mid/rear door enable or open position, or a mid or rear door panel is opened more than 3 inches from the fully closed position (as measured at the leading edge of the door panel). The interlock engagement shall bring the bus to a smooth stop and shall be capable of holding a fully loaded bus on a 6 percent grade, with the engine at idle and the transmission in gear, until the

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interlocks are released. These interlock functions shall be active whenever the vehicle Master Run Switch is in any run position.

All door systems employing brake and accelerator interlocks shall be supplied with supporting failure modes and effects analysis (FMEA) documentation, which demonstrates that failure modes are of a failsafe type, thereby never allowing the possibility of release of interlock while an interlocked door is in and unsecured condition, unless the door master switch has been actuated to intentionally release the interlocks.

Braking effort adjustable with hand tools.
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No requirements for accelerator and brake interlocks whenever front doors are open by the driver's door controller.

When the rear door emergency device is actuated, the door interlock throttle system shall return the engine to idle and the door interlock brake system shall apply to stop the bus. When the front door emergency device is actuated only the door interlock throttle system shall be actuated. (See TS 78.8, Emergency Operation).
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TS 37. Pneumatic System

TS 37.1 General

The bus air system shall operate the air-powered accessories and the braking system with reserve capacity. New buses shall not leak down more than 5 psi over a 15-minute period of time as indicated on the dash gauge.

Provision shall be made to apply shop air to the bus air systems. A quick disconnect fitting shall be easily accessible and located in the engine compartment and near the front bumper area for towing. Retained caps shall be installed to protect fitting against dirt and moisture when not in use. Air for the compressor shall be filtered. The air system shall be protected per FMVSS 121.

TS 37.2 Air Compressor

The engine-driven air compressor shall be sized to charge the air system from 40 psi to the governor cut-off pressure in less than 3 minutes while not exceeding the fast idle speed setting of the engine.

TS 37.3 Air Lines and Fittings

Air lines, except necessary flexible lines, shall conform to the installation and material requirements of SAE Standard J1149 for copper tubing with standard, brass, flared or ball sleeve fittings, or SAE Standard J844 for nylon tubing if not subject to temperatures over 200°F. The air on the delivery side of the compressor where it enters nylon housing shall not be above the maximum limits as stated in SAE Standard J844. Nylon tubing shall be installed in accordance with the following color-coding standards:

- **Green:** Indicates primary brakes and supply.
- **Red:** Indicates secondary brakes.
- **Brown:** Indicates parking brake
- **Yellow:** Indicates compressor governor signal.
- **Black:** Indicates accessories.

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Line supports shall prevent movement, flexing, tension, strain and vibration. Copper lines shall be supported to prevent the lines from touching one another or any component of the bus. To the extent practicable and before installation, the lines shall be pre-bent on a fixture that prevents tube flattening or excessive local strain. Copper lines shall be bent only once at any point, including pre-bending and installation. Rigid lines shall be supported at no more than 5-ft intervals. Nylon lines may be grouped and shall be supported at 30-inch intervals or less.

The compressor discharge line between powerplant and body-mounted equipment shall be flexible convoluted copper or stainless steel line, or may be flexible Teflon hose with a braided stainless steel jacket. Other lines necessary to maintain system reliability shall be flexible Teflon hose with a braided stainless steel jacket. End fittings shall be standard SAE or JIC brass or steel, flanged, swivel-type fittings. Flexible hoses shall be as short as practicable and individually supported. They shall not touch one another or any part of the bus except for the supporting grommets. Flexible lines shall be supported at 2-ft intervals or less.

Air lines shall be clean before installation and shall be installed to minimize air leaks. All air lines shall be routed to prevent water traps to the extent possible. Grommets or insulated clamps shall protect the air lines at all points where they pass through understructure components.

TS 37.4 Air Reservoirs

All air reservoirs shall meet the requirements of FMVSS Standard 121 and SAE Standard J10 and shall be equipped with drain plugs and guarded or flush type drain valves. Major structural members shall protect these valves and any automatic moisture ejector valves from road hazards. Reservoirs shall be sloped toward the drain valve. All air reservoirs shall have drain valves that discharge below floor level with lines routed to eliminate the possibility of water traps and/or freezing in the drain line.

TS 37.5 Air System Dryer

An air dryer shall prevent accumulation of moisture and oil in the air system. The air dryer system shall include one or more replaceable desiccant cartridges.

A 2M/3M mechanic shall replace the desiccant in less than 15 minutes.

Requirement for Additional Oil Separator Provision

A provision shall be included to collect/remove oil from the air system to prevent affecting function and/or damaging pneumatic system components.
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ELECTRICAL, ELECTRONIC AND DATA COMMUNICATION SYSTEMS

TS 38. Overview

The electrical system will consist of vehicle battery systems and components that generate, distribute and store power throughout the vehicle (e.g., generator, voltage regulator, wiring, relays, and connectors).

Electronic devices are individual systems and components that process and store data, integrate electronic information or perform other specific functions.

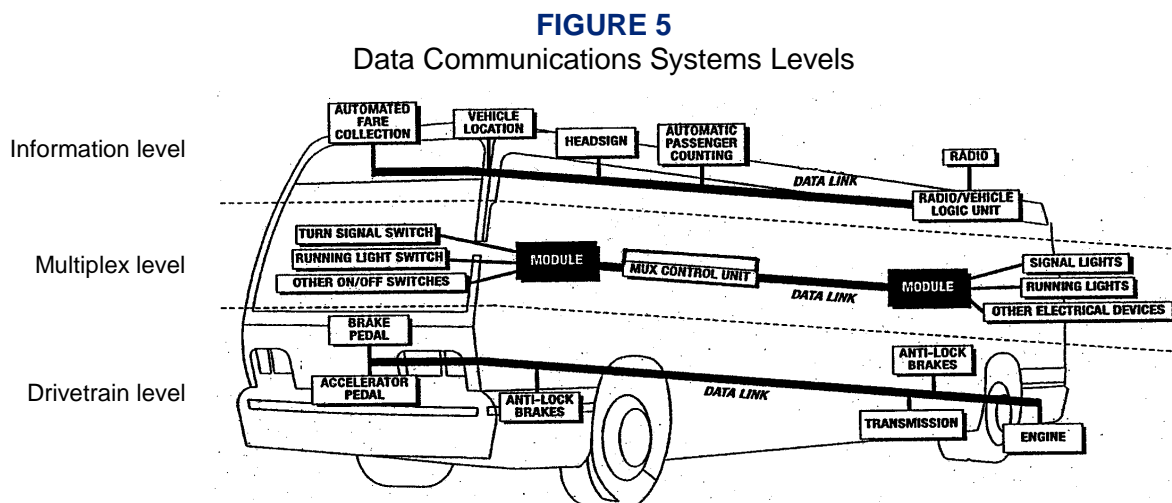
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The data communication system consists of the bi-directional communications networks that electronic devices use to share data with other electronic devices and systems. Communication networks are essential to integrating electronic functions, both onboard the vehicle and off.

Information level systems that require vehicle information for their operations or provide information shall adhere to J1939 data standard.

Data communications systems are divided into three levels to reflect the use of multiple data networks:

- **Drivetrain level:** Components related to the drivetrain including the propulsion system components (engine, transmission and hybrid units), and anti-lock braking system (ABS), which may include traction control.
- **Information level:** Components whose primary function is the collection, control or display of data that is not necessary to the safe drivability of the vehicle (i.e., the vehicle will continue to operate when those functions are inoperable). These components typically consist of those required for automatic vehicle location (AVL) systems, destination signs, fare boxes, passenger counters, radio systems, automated voice and signage systems, video surveillance and similar components.
- **Multiplex level:** Electrical or electronic devices controlled through input/output signals such as discrete, analog and serial data information (i.e., on/off switch inputs, relay or relay control outputs). Multiplexing is used to control components not typically found on the drivetrain or information levels, such as lights; wheelchair lifts; doors; heating, ventilation and air conditioning (HVAC) systems; and gateway devices.



TS 38.1 Modular Design

Design of the electrical, electronic and data communication systems shall be modular so that each electronic device, apparatus panel, or wiring bundle is easily separable from its interconnect by means of connectors.

Powerplant wiring shall be an independent wiring harness. Replacement of the engine compartment wiring harness(es) shall not require pulling wires through any bulkhead or removing any terminals from the wires.

TS 39. Environmental and Mounting Requirements

The electrical system and its electronic components shall be capable of operating in the area of the vehicle in which they will be installed, as recommended in SAE Standard J1455.

Electrical and electronic equipment shall not be located in an environment that will reduce the performance or shorten the life of the component or electrical system when operating within the design operating profile. As a recommendation, no vehicle component shall generate, or be affected by, electromagnetic interference or radio frequency interference (EMI/RFI) that can disturb the performance of electrical/electronic equipment as defined in SAE Standard J1113 and UNECE Council Directive 95/54 (R 10).

The GVI shall follow recommendations from bus manufacturers and subsystem Suppliers regarding methods to prevent damage from voltage spikes generated from welding, jump starts, shorts, etc.

TS 39.1 Hardware Mounting

The mounting of the hardware shall not be used to provide the sole source ground, and all hardware shall be isolated from potential EMI/RFI, as referenced in SAE Standard J1113.

All electrical/electronic hardware mounted in the interior of the vehicle shall be inaccessible to passengers and hidden from view unless intended to be viewed. The hardware shall be mounted in such a manner as to protect it from splash or spray.

All electrical/electronic hardware mounted on the exterior of the vehicle that is not designed to be installed in an exposed environment shall be mounted in a sealed enclosure.

All electrical/electronic hardware and its mounting shall comply with the shock and vibration requirements of SAE J1455.

TS 40. General Electrical Requirements

TS 40.1 Batteries

TS 40.1.1 Low-Voltage Batteries (24V)

Two 8D Battery Units

Two 8D battery units conforming to SAE Standard J537 shall be provided. Each battery shall have a minimum of 1150 cold cranking amps. Each battery shall have a purchase date no more than 120 days from the date of release, and shall be fully maintained prior to shipment to the GVI. The battery compartment must be well-ventilated to prevent hydrogen buildup while protecting the compartment from road spray, water intrusion and de-icing chemicals.

Different Size Terminal Ends

Positive and negative terminal ends shall be different sizes.

TS 40.1.2 Battery Cables

The battery terminal ends and cables shall be color-coded with red for the primary positive, black for negative and another color for any intermediate voltage cables. Positive and negative battery cables shall

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not cross each other if at all possible, be flexible and sufficiently long to reach the batteries with the tray in the extended position without stretching or pulling on any connection and shall not lie directly on top of the batteries. Except as interrupted by the master battery switch, battery and starter wiring shall be continuous cables with connections secured by bolted terminals and shall conform to specification requirements of SAE Standard J1127 – Type SGT, SGX or GXL and SAE Recommended Practice J541.

2100 strand 4/0 cable or greater recommended.

TS 40.1.3 Jump Start

No requirements for jump-start connector.

TS 40.1.4 Battery Compartment

The battery compartment shall prevent accumulation of debris on top of the batteries and shall be vented and self-draining. It shall be accessible only from the outside of the vehicle. All components within the battery compartment, and the compartment itself, shall be protected from damage or corrosion from the electrolyte. The inside surface of the battery compartment's access door shall be electrically insulated, as required, to prevent the battery terminals from shorting on the door if the door is damaged in an accident or if a battery comes loose.

The vehicle shall be equipped with a 12VDC and 24VDC quick disconnect switch(es). The battery compartment door shall conveniently accommodate operation of the 12VDC and 24VDC quick disconnect switch(es).

The battery quick disconnect access door shall be identified with a decal. The decal size shall not be less than 3.5 × 5 inches (8.89 × 12.7 cm).

The battery hold-down bracket shall be constructed of a non-metallic material (plastic or fiberglass).

This access door shall not require any special locking devices to gain access to the switch, and it shall be accessible without removing or lifting the panel. The door shall be flush-fitting and incorporate a spring tensioner or equal to retain the door in a closed position when not in use.

The batteries shall be securely mounted on a stainless steel or equivalent tray that can accommodate the size and weight of the batteries. The battery tray shall pull out easily and properly support the batteries while they are being serviced. The tray shall allow each battery cell to be easily serviced and filled. A locking device shall retain the battery tray to the stowed position.

If not located in the engine compartment, the same fire-resistant properties must apply to the battery compartment. No sparking devices should be located within the battery box.

TS 40.1.5 Auxiliary Electronic Power Supply

If required, gel-pack, or any form of sealed (non-venting) batteries used for auxiliary power are allowed to be mounted on the interior of the vehicle if they are contained in an enclosed, non-airtight compartment and accessible only to maintenance personnel. This compartment shall contain a warning label prohibiting the use of lead-acid batteries.

TS 40.1.6 Master Battery Switch

A single master switch shall be provided near the battery compartment for the disconnecting of all battery positives (12V and 24V), except for safety devices such as the fire suppression system and other systems as specified. The location of the master battery switch shall be clearly identified on the exterior access panel, be accessible in less than 10 seconds for deactivation and prevent corrosion from fumes and battery acid when the batteries are washed off or are in normal service.

Turning the master switch off with the powerplant operating shall shut off the engine and shall not damage any component of the electrical system. The master switch shall be capable of carrying and interrupting the total circuit load.

The batteries shall be equipped with a single switch for disconnecting both 12V and 24V power.

TS 40.1.7 Low-Voltage Generation and Distribution

The low-voltage generating system shall maintain the charge on fully charged batteries, except when the vehicle is at standard idle with a total low voltage generator load exceeding 70 percent of the low voltage generator nameplate rating.

Use of fast idle shall maintain a charge on fully charged batteries so long as the total alternator load does not exceed 90 percent of the alternator nameplate rating.

The vehicle manufacturer shall provide to the GVI prior to production an analysis of the estimated electrical load for each system.

Voltage monitoring and over-voltage output protection (recommended at 32V) shall be provided.

Dedicated power and ground shall be provided as specified by the component or system manufacturer. Cabling to the equipment must be sized to supply the current requirements with no greater than a 5 percent volt drop across the length of the cable.

TS 40.1.8 Circuit Protection

All branch circuits, except battery-to-starting motor and battery-to-generator/alternator circuits, shall be protected by current-limiting devices such as circuit breakers, fuses or solid state devices sized to the requirements of the circuit. Electronic circuit protection for the cranking motor shall be provided to prevent engaging of the motor for more than 30 seconds at a time to prevent overheating. The circuit breakers or fuses shall be easily accessible for authorized personnel. Fuses shall be used only where it can be demonstrated that circuit breakers are not practicable. This requirement applies to in-line fuses supplied by either the Contractor or a Supplier. Fuse holders shall be constructed to be rugged and waterproof. All manual reset circuit breakers critical to the operation of the bus shall be mounted in a location convenient to the GVI mechanic with visible indication of open circuits. The GVI shall consider the application of automatic reset circuit breakers on a case-by-case basis. The Contractor shall show all in-line fuses in the final harness drawings. Any manually resettable circuit breakers shall provide a visible indication of open circuits.

Circuit breakers or fuses shall be sized to a minimum of 15 percent larger than the total circuit load. The current rating for the wire used for each circuit must exceed the size of the circuit protection being used.

TS 40.2 Grounds

The battery shall be grounded to the vehicle chassis/frame at one location only, as close to the batteries as possible. When using a chassis ground system, the chassis shall be grounded to the frame in multiple locations, evenly distributed throughout the vehicle to eliminate ground loops. No more than four ground ring/spade terminal connections shall be made per ground stud. Electronic equipment requiring an isolated ground to the battery (i.e., electronic ground) shall not be grounded through the chassis.

TS 40.3 Low Voltage/Low Current Wiring and Terminals

All power and ground wiring shall conform to specification requirements of SAE Recommended Practice J1127, J1128 and J1292. Double insulation shall be maintained as close to the junction box, electrical compartment or terminals as possible. The requirement for double insulation shall be met by wrapping the harness with plastic electrical tape or by sheathing all wires and harnesses with non-conductive, rigid or flexible conduit.

Wiring shall be grouped, numbered and/or color-coded. Wiring harnesses shall not contain wires of different voltage classes unless all wires within the harness are insulated for the highest voltage present in the harness. Kinking, grounding at multiple points, stretching, and exceeding minimum bend radius shall be prevented.

Strain-relief fittings shall be provided at all points where wiring enters electrical compartments. Grommets or other protective material shall be installed at points where wiring penetrates metal structures outside of electrical enclosures. Wiring supports shall be protective and non-conductive at areas of wire contact and shall not be damaged by heat, water, solvents or chafing.

To the extent practicable, wiring shall not be located in environmentally exposed locations under the vehicle. Wiring and electrical equipment necessarily located under the vehicle shall be insulated from water, heat, corrosion and mechanical damage. Where feasible, front to rear electrical harnesses should be installed above the window line of the vehicle.

All wiring harnesses over 5 ft long and containing at least five wires shall include 10 percent (minimum one wire) excess wires for spares. This requirement for spare wires does not apply to data links and communication cables. Wiring harness length shall allow end terminals to be replaced twice without pulling, stretching or replacing the wire. Terminals shall be crimped to the wiring according to the connector manufacturer's recommendations for techniques and tools. All cable connectors shall be locking type, keyed and sealed, unless enclosed in watertight cabinets or vehicle interior. Pins shall be removable, crimp contact type, of the correct size and rating for the wire being terminated. Unused pin positions shall be sealed with sealing plugs. Adjacent connectors shall either use different inserts or different insert orientations to prevent incorrect connections.

Terminals shall be crimped, corrosion-resistant and full ring type or interlocking lugs with insulating ferrules. When using pressure type screw terminal strips, only stranded wire shall be used. Insulation clearance shall ensure that wires have a minimum of "visible clearance" and a maximum of two times the conductor diameter or 1/16 inch, whichever is less. When using shielded or coaxial cable, upon stripping of the insulation, the metallic braid shall be free from frayed strands that can penetrate the insulation of the inner wires.

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Ultra-sonic and T-splices may be used with 7 American Wire Gauge (AWG) or smaller wire. When a T-splice is used, it shall meet these additional requirements:

- It shall include a mechanical clamp in addition to solder on the splice.
- The wire shall support no mechanical load in the area of the splice.
- The wire shall be supported to prevent flexing.

All splicing shall be staggered in the harness so that no two splices are positioned in the same location within the harness.

Wiring located in the engine compartment shall be routed away from high-heat sources or shielded and/or insulated from temperatures exceeding the wiring and connector operating requirements.

The instrument panel and wiring shall be easily accessible for service from the driver's seat or top of the panel. The instrument panel shall be separately removable and replaceable without damaging the instrument panel or gauges. Wiring shall have sufficient length and be routed to permit service without stretching or chafing the wires.

TS 40.4 Electrical Components

All electrical components, including switches, relays, flashers and circuit breakers, shall be heavy-duty designs with either a successful history of application in heavy-duty vehicles or design specifications for an equivalent environment.

All electric motors shall be heavy-duty brushless type where practical, and have a continuous duty rating of no less than 40,000 hours (except cranking motors, washer pumps and wiper motors). All electric motors shall be easily accessible for servicing.

TS 40.5 Electrical Compartments

All relays, controllers, flashers, circuit breakers and other electrical components shall be mounted in easily accessible electrical compartments. All compartments exposed to the outside environment shall be corrosion-resistant and sealed. The components and their functions in each electrical compartment shall be identified and their location permanently recorded on a drawing attached to the inside of the access panel or door. The drawing shall be protected from oil, grease, fuel and abrasion.

The front compartment shall be completely serviceable from the driver's seat, vestibule or from the outside. "Rear start and run" controls shall be mounted in an accessible location in the engine compartment and shall be protected from the environment.

TS 41. General Electronic Requirements

If an electronic component has an internal real-time clock, it shall provide its own battery backup to monitor time when battery power is disconnected, and/or it may be updated by a network component. If an electronic component has an hour meter, it shall record accumulated service time without relying on battery backup.

All electronic component Suppliers shall ensure that their equipment is self-protecting in the event of shorts in the cabling, and also in over-voltage (over 32V DC on a 24V DC nominal voltage rating with a maximum of 50V DC) and reverse polarity conditions. If an electronic component is required to interface with other components, it shall not require external pull-up and/or pull-down resistors. Where this is not

possible, the use of a pull-up or pull-down resistor shall be limited as much as possible and easily accessible and labeled.

TS 41.1 Wiring and Terminals

Kinking, grounding at multiple points, stretching and reducing the bend radius below the manufacturer's recommended minimum shall not be permitted.

TS 41.1.1 Discrete I/O (Inputs/Outputs)

All wiring to I/O devices, either at the harness level or individual wires, shall be labeled, stamped or color-coded in a fashion that allows unique identification at a spacing not exceeding 4 inches. Wiring for each I/O device shall be bundled together. If the I/O terminals are the same voltages, then jumpers may be used to connect the common nodes of each I/O terminal.

TS 41.1.2 Shielding

All wiring that requires shielding shall meet the following minimum requirements. A shield shall be generated by connecting to a ground, which is sourced from a power distribution bus bar or chassis. A shield shall be connected at one location only, typically at one end of the cable. However certain standards or special requirements, such as SAE Standard J1939 or radio frequency (RF) applications, have separate shielding techniques that also shall be used as applicable.

NOTE: A shield grounded at both end forms a ground loop, which can cause intermittent control or faults.

When using shielded or coaxial cable, upon stripping of the insulation, the metallic braid shall be free from frayed strands, which can penetrate the insulation of the inner wires. To prevent the introduction of noise, the shield shall not be connected to the common side of a logic circuit.

TS 41.1.3 Communications

The data network cabling shall be selected and installed according to the selected protocol requirements. The physical layer of all network communication systems shall not be used for any purpose other than communication between the system components, unless provided for in the network specifications.

Communications networks that use power line carriers (e.g., data modulated on a 24V-power line) shall meet the most stringent applicable wiring and terminal specifications.

TS 41.1.4 Radio Frequency (RF)

RF components, such as radios, video devices, cameras, global positioning systems (GPS), etc., shall use coaxial cable to carry the signal. All RF systems require special design consideration for losses along the cable. Connectors shall be minimized, since each connector and crimp has a loss that will attribute to attenuation of the signal. Cabling should allow for the removal of antennas or attached electronics without removing the installed cable between them. If this cannot be done, then a conduit of sufficient size shall be provided for ease of attachment of antenna and cable assembly. The corresponding component vendors shall be consulted for proper application of equipment, including installation of cables.

TS 41.1.5 Audio

Cabling used for microphone level and line level signals shall be 22 AWG minimum with shielded twisted pair. Cabling used for amplifier level signals shall be 18 AWG minimum.

TS 42. Multiplexing

TS 42.1 General

The primary purpose of the multiplexing system is control of components necessary to operate the vehicle. This is accomplished by processing information from input devices and controlling output devices through the use of an internal logic program.

Versatility and future expansion shall be provided for by expandable system architecture. The multiplex system shall be capable of accepting new inputs and outputs through the addition of new modules and/or the utilization of existing spare inputs and outputs. All like components in the multiplex system shall be modular and interchangeable with self-diagnostic capabilities. The modules shall be easily accessible for troubleshooting electrical failures and performing system maintenance. Multiplex input/output modules shall use solid-state devices to provide extended service life and individual circuit protection.

Ten percent of the total number of inputs and outputs, or at least one each for each voltage type utilized (0V, 12V, 24V), at each module location shall be designated as spares.

TS 42.2 System Configuration

Multiplexing may either be distributed or centralized. A distributed system shall process information on multiple control modules within the network. A centralized system shall process the information on a single control module. Either system shall consist of several modules connected to form a control network.

TS 42.2.1 I/O Signals

The input/output for the multiplex system may contain three types of electrical signals: discrete, analog or serial data.

Discrete signals shall reflect the on/off status of switches, levers, limit switches, lights, etc. Analog signals shall reflect numerical data as represented by a voltage signal (0-12V, 10-24V, etc.) or current signal (4-20 mA). Both types of analog signals shall represent the status of variable devices such as rheostats, potentiometers, temperature probes, etc. Serial data signals shall reflect ASCII or alphanumeric data used in the communication between other on-board components.

TS 43 Data Communications

TS 43.1 General

All data communication networks shall be either in accordance with a nationally recognized interface standard, such as those published by SAE, IEEE or ISO, or shall be published to the GVI with the following minimum information:

- Protocol requirements for all timing issues (bit, byte, packet, inter-packet timing, idle line timing, etc.) packet sizes, error checking and transport (bulk transfer of data to/from the device).
- Data definition requirements that ensure access to diagnostic information and performance characteristics.

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- The capability and procedures for uploading new application or configuration data.
- Access to revision levels of data, application software and firmware.
- The capability and procedures for uploading new firmware or application software.
- Evidence that applicable data shall be broadcast to the network in an efficient manner such that the overall network integrity is not compromised.

Any electronic vehicle components used on a network shall be conformance tested to the corresponding network standard.

TS 43.2 Drivetrain Level

Drivetrain components, consisting of the engine, engine brake, transmission, anti-lock braking system and all other related components, shall be integrated and communicate fully with respect to vehicle operation with data using SAE Recommended Communications Protocols such as J1939 and/or J1708/J1587 with forward and backward compatibilities or other open protocols.

TS 43.2.1 Diagnostics, Fault Detection and Data Access

Drivetrain performance, maintenance and diagnostic data, and other electronic messages shall be formatted and transmitted on the communications networks.

The drivetrain level shall have the ability to record abnormal events in memory and provide diagnostic codes and other information to service personnel. At a minimum, this network level shall provide live/fail status, current hardware serial number, software/data revisions and uninterrupted timing functions.

Access to Drivetrain data shall be provided through diagnostic device connector ports in the engine compartment and the driver's area.

TS 43.2.2 Programmability (Software)

The drivetrain level components shall be programmable by the GVI with limitations as specified by the sub-system Supplier.

TS 43.3 Multiplex Level

TS 43.3.1 Data Access

At a minimum, information shall be made available via a communication port on the multiplex system. The location of the communication port shall be easily accessible.

The communication port(s) shall be located in the driver's area.

TS 43.3.2 Diagnostics and Fault Detection

The multiplex system shall have a proven method of determining its status (system health and input/output status) and detecting either active (online) or inactive (offline) faults through the use of on-board visual/audible indicators.

In addition to the indicators, the system shall employ an advanced diagnostic and fault detection system, which shall be accessible via either a personal computer or a handheld unit. Either unit shall have the ability to check logic function. The diagnostic data can be incorporated into the information level network or the central data access system.

TS 43.3.3 Programmability (Software)

The multiplex system shall have security provisions to protect its software from unwanted changes. This shall be achieved through any or all of the following procedures:

- password protection
- limited distribution of the configuration software
- limited access to the programming tools required to change the software
- hardware protection that prevents undesired changes to the software

Provisions for programming the multiplex system shall be possible through a PC or laptop. The multiplex system shall have proper revision control to ensure that the hardware and software are identical on each vehicle equipped with the system. Revision control shall be provided by all of the following:

- hardware component identification where labels are included on all multiplex hardware to identify components
- hardware series identification where all multiplex hardware displays the current hardware serial number and firmware revision employed by the module
- software revision identification where all copies of the software in service displays the most recent revision number
- a method of determining which version of the software is currently in use in the multiplex system

Revision control labels shall be electronic.

TS 43.4 Electronic Noise Control

Electrical and electronic sub-systems and components on all buses shall not emit electromagnetic radiation that will interfere with on-board systems, components or equipment, telephone service, radio or TV reception or violate regulations of the Federal Communications Commission.

Electrical and electronic sub-systems on the coaches shall not be affected by external sources of RFI/EMI. This includes, but is not limited to, radio and TV transmission, portable electronic devices including computers in the vicinity of or onboard the buses, ac or dc power lines and RFI/EMI emissions from other vehicles.

DRIVER PROVISIONS, CONTROLS AND INSTRUMENTATION

TS 44. Driver's Area Controls

TS 44.1 General

In general when designing the driver's area, it is recommended that SAE J833, "Human Physical Dimensions," be used.

Switches and controls shall be divided into basic groups and assigned to specific areas, in conformance with SAE Recommended Practice J680, Revised 1988, "Location and Operation of Instruments and Controls in Motor Truck Cabs," and be essentially within the hand reach envelope described in SAE Recommended Practice J287, "Driver Hand Control Reach."

TS 44.2 Glare

The driver's work area shall be designed to minimize glare to the extent possible. Objects within and adjacent to this area shall be matte black or dark gray in color wherever possible to reduce the reflection of light onto the windshield. The use of polished metal and light-colored surfaces within and adjacent to the driver's area shall be avoided.

TS 44.3 Visors/Sun Shades

Front and Side Sun Shade/Visor

Adjustable sun visor(s) shall be provided for the driver's windshield and the driver's side window. Visors shall be shaped to minimize light leakage between the visor and windshield pillars. Visors shall store out of the way and shall not obstruct airflow from the climate control system or interfere with other equipment, such as the radio handset or the destination control. Deployment of the visors shall not restrict vision of the rearview mirrors. Visor adjustments shall be made easily by hand with positive locking and releasing devices and shall not be subject to damage by over-tightening. Sun visor construction and materials shall be strong enough to resist breakage during adjustments. Visors may be transparent, but shall not allow a visible light transmittance in excess of 10 percent. Visors, when deployed, shall be effective in the driver's field of view at angles more than 5 degrees above the horizontal.

TS 44.4 Driver's Controls

Frequently used controls must be in easily accessible locations. These include the door control, kneel control, windshield wiper/washer controls, ramp, and lift and run switch. Any switches and controls necessary for the safe operation of the bus shall be conveniently located and shall provide for ease of operation. They shall be identifiable by shape, touch and permanent markings. Controls also shall be located so that passengers may not easily tamper with control settings.

All panel-mounted switches and controls shall be marked with easily read identifiers. Graphic symbols shall conform to SAE Recommended Practice J2402, "Road Vehicles – Symbols For Controls, Indicators, and Tell Tales," where available and applicable. Color of switches and controls shall be dark with contrasting typography or symbols.

Mechanical switches and controls shall be replaceable, and the wiring at these controls shall be serviceable from a convenient location. Switches, controls and instruments shall be dust- and water-resistant.

TS 44.5 Normal Bus Operation Instrumentation and Controls

The following list identifies bus controls used to operate the bus. These controls are either frequently used or critical to the operation of the bus. They shall be located within easy reach of the operator. The operator shall not be required to stand or turn to view or actuate these controls unless specified otherwise.

Systems or components monitored by onboard diagnostics system shall be displayed in clear view of the operator and provide visual and/or audible indicators. The intensity of indicators shall permit easy determination of on/off status in bright sunlight but shall not cause a distraction or visibility problem at night. All indicators shall be illuminated using backlighting.

The indicator panel shall be located in Area 1 or Area 5, within easy view of the operator instrument panel. All indicators shall have a method of momentarily testing their operation. The audible alarm shall

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be tamper-resistant and shall have an outlet level between 80 and 83 dBA when measured at the location of the operator's ear.

On-board displays visible to the operator shall be limited to indicating the status of those functions described herein that are necessary for the operation of the bus. All other indicators needed for diagnostics and their related interface hardware shall be concealed and protected from unauthorized access. Table 5 represents instruments and alarms. The intent of the overall physical layout of the indicators shall be in a logical grouping of systems and severity nature of the fault.

Consideration shall be provided for future additions of spare indicators as the capability of onboard diagnostic systems improves. Blank spaces shall contain LEDs.

The locations of the driver's controls in the following table are intended to be consistent with right-hand drive. The Contractor shall propose the configuration of the controls, which shall be subject to the approval of the GVI.

TABLE 5
Transit Bus Instruments and Alarms

Device	Description	Location	Function	Visual/ Audible
Master run switch	Rotary, four-position detent	Side console	Master control for bus, off, day run, night run and clearance ID lights	
Engine start, front	Approved momentary switch	Side console	Activates engine starter motor	
Engine start, rear	Approved momentary switch	Engine compartment	Activates engine starter motor	
Engine run, rear	Three-position toggle switch	Engine compartment	Permits running engine from rear start, normal front run position and off	Amber light
Drive selector	Touch panel switch	Side console	Provides selection of propulsion: forward, reverse and neutral	Gear selection
HVAC	Switch or switches to control HVAC	Side console	Permits selection of passenger ventilation: off, cool, heat, low fan, high fan or full auto with on/off only	
Driver's ventilation	Rotary, three-position detent	Side console or Dash right wing	Permits supplemental ventilation: fan off, low or high	
Defroster fan	Rotary, three-position detent	Side console or Dash right wing	Permits defroster: fan off, low, medium or high	
Defroster temperature	Variable position	Side console or Dash right wing	Adjusts defroster water flow and temperature	
Windshield wiper	One-variable rotary position operating both wipers	Dash right wing	Variable speed control of left and right windshield wipers	
Windshield washer	Push button	Dash right wing	Activates windshield washers	

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TABLE 5
Transit Bus Instruments and Alarms

Device	Description	Location	Function	Visual/ Audible
Dash panel lights	Rotary rheostat or stepping switch	Side Console or Dash right wing	Provides adjustment for light intensity in night run position	
Interior lights	Three-position switch	Side console	Selects mode of passenger compartment lighting: off, on, normal	
Fast idle	Two-position switch	Side console	Selects high idle speed of engine	
WC ramp/kneel enable	Two-position switch ¹	Side console or Dash left wing	Permits operation of ramp and kneel operations at each door remote panel	Amber light
Front door ramp/kneel enable	Two-position keyed switch ¹	Front door remote or Dash left wing	Permits ramp and kneel activation from front door area, key required ¹	Amber light
Front door ramp	Three-position momentary switch	Left side of steering wheel	Permits deploy and stow of front ramp	Red light
Front kneel	Three-position momentary switch	Front door remote	Permits kneeling activation and raise and normal at front door remote location	Amber or red dash indicator. Ext alarm and Amber light
Rear door ramp/kneel enable	Two-position keyed switch ¹	Rear door remote	Permits ramp and kneel activation from rear door area, key required ¹	Red light
Rear door ramp	Three-position momentary switch	Rear door remote	Permits deploy and stow of rear ramp	
Rear kneel	Three-position momentary switch	Rear door remote	Permits kneeling activation and raise and normal at rear door remote location	
Silent alarm	Recessed push button, NO and NC contacts momentary	Side console	Activates emergency radio alarm at dispatch and permits covert microphone and/or enables destination sign emergency message	
Video system event switch	Momentary on/off momentary switch with plastic guard	Side console	Triggers event equipment, triggers event light on dash	Amber light
Right remote mirror	Four-position toggle type	Side console	Permits two-axis adjustment of right exterior mirror	
Left remote mirror	Four-position toggle type	Side console	Permits two-axis adjustment of left exterior mirror	
Mirror heater	Switch or temperature activated	Side console	Permits heating of outside mirrors when required	
Passenger door control	Five-position handle type detent or two momentary push buttons	Side console, forward	Permits open/close control of front and rear passenger doors	Red light

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TABLE 5
Transit Bus Instruments and Alarms

Device	Description	Location	Function	Visual/ Audible
Rear door override	Two-position switch in approved location	Side console, forward	Allows driver to override activation of rear door passenger tape switches	
Engine shutdown override	Momentary switch with operation protection	Side console	Permits driver to override auto engine shutdown	
Hazard flashers	Two-position switch	Side console or Dash left wing	Activates emergency flashers	Two green lights
Mobile data terminal	Mobile data terminal coach operator interface panel	Above left dash wing	Facilitates driver interaction with communication system and master log-on	LCD display with visual status and text messages
Farebox interface	Farebox coach operator interface panel	Near farebox	Facilitates driver interaction with farebox system	LCD display
Destination sign interface	Destination sign interface panel	in approved location	Facilitates driver interaction with destination sign system, manual entry	LCD display
Turn signals	Momentary push button (two required) raised from other switches	Left foot panel	Activates left and right turn signals	Two green lights and optional audible indicator
PA manual	Momentary push button	In approved location	Permits driver to manually activate public address microphone	
Low profile microphone	Low-profile discrete Mounting	Steering column	Permits driver to make announcements with both hands on the wheel and focusing on road conditions	
High beam	Detented push button	In approved location	Permits driver to toggle between low and high beam	Blue light
Parking brake	Pneumatic PPV	Side console or Dash right wing	Permits driver to apply and release parking brake	Red light
Park brake release	Pneumatic PPV	Vertical side of the side console or dash center	Permits driver to push and hold to release brakes	
Remote engine speed	Rotary rheostat	Engine compartment	Permits technician to raise and lower engine RPM from engine compartment	
Master door/ interlock	Multi-pole toggle, detented	Out of operator's reach	Permits driver override to disable door and brake/throttle interlock	Red light
Warning interlocks deactivated	Red indicator light	Dash panel center	Illuminates to warn drive that interlocks have been deactivated.	Red light
Retarder disable	No retarder			

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TABLE 5
Transit Bus Instruments and Alarms

Device	Description	Location	Function	Visual/ Audible
Alarm acknowledge	Push button momentary	Approved location	Permits driver to acknowledge alarm condition	
Rear door passenger sensor disable	Multi-pole toggle, detented	In sign compartment or Driver's barrier compartment	Permits driver to override rear door passenger sensing system	
Indicator/ alarm test button	Momentary switch or programming ¹	Dash center panel	Permits driver to activate test of sentry, indicators and audible alarms	All visuals and audibles
Auxiliary power	110-volt power receptacle	Approved location	Property to specify what function to supply	
Speedometer	Speedometer, odometer, and diagnostic capability, 5-mile increments	Dash center panel	Visual indication of speed and distance traveled, accumulated vehicle mileage, fault condition display	Visual
Air pressure gauge	Primary and secondary, 5 psi increments	Dash center panel	Visual indication of primary and secondary air systems	Red light and buzzer
Fire detection	Coach operator display	Property specific or dash center	Indication of fire detection activation by zone/location	Buzzer and red light
Door obstruction	Sensing of door obstruction	Dash center	Indication of rear door sensitive edge activation	Red light and buzzer
Door ajar	Door not properly closed	Property specific or dash center	Indication of rear door not properly closed	Buzzer or alarm and red light
Low system air pressure	Sensing low primary and secondary air tank pressure	Dash center	Indication of low air system pressure	Buzzer and red light
Engine coolant indicator	Low coolant indicator may be supplied as audible alert and visual and/or text message	Within driver's sight	Detects low coolant condition	Amber light
Hot engine indicator	Coolant temperature indicator may be supplied as audible alert and visual and/or text message	Within driver's sight	Detects hot engine condition and initiates time delay shutdown	Red light
Low engine oil pressure indicator	Engine oil pressure indicator may be supplied as audible alert and visual and/or text message	Within driver's sight	Detects low engine oil pressure condition and initiates time-delayed shutdown	Red light
ABS indicator	Detects system status	Dash center	Displays system failure	Amber light
HVAC indicator	Detects system status	Dash center	Displays system failure	Amber or red light

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TABLE 5
Transit Bus Instruments and Alarms

Device	Description	Location	Function	Visual/ Audible
Charging system indicator (12/24 V)	Detect charging system status	Dash center	Detects no charge condition and optionally detects battery high, low, imbalance, no charge condition, and initiates time-delayed shutdown	Red light flashing or solid based on condition
Bike rack deployed indicator	Not used			
Fuel tank level	Analog gauge, graduated based on fuel type	Dash center	Indication of fuel tank level/pressure	
DEF gauge	Level Indicator	Center dash	Displays level of DEF tank and indicates with warning light when low	Red light
Active regeneration	Detects Status	Dash center	Indication of electric regeneration	Amber or red light

1. Indicate area by drawing. Break up switches control from indicator lights.

TS 44.6 Driver Foot Controls

Accelerator and brake pedals shall be designed for ankle motion. Foot surfaces of the pedals shall be faced with wear-resistant, nonskid, replaceable material.

TS 44.6.1 Pedal Angle

The vertical angle of the accelerator and brake pedals shall be determined from a horizontal plane regardless of the slope of the cab floor. The accelerator and brake pedals shall be positioned at an angle of 37 to 50 degrees at the point of initiation of contact and extend downward to an angle of 10 to 18 degrees at full throttle.

The location of the brake and accelerator pedals shall be determined by the manufacturer, based on space needs, visibility, lower edge of windshield, and vertical H-point.

TS 44.6.2 Pedal Dimensions and Position

The floor-mounted accelerator pedal shall be 10 to 12 inches long and 3 to 4 inches wide. Clearance around the pedal must allow for no interference precluding operation.

1 to 2 inches Between Brake and Accelerator Pedals

The accelerator and brake pedals shall be positioned such that the spacing between them, measured at the heel of the pedals, is between 1 and 2 inches. Both pedals should be located approximately on the same plane coincident to the surface of the pedals.

TS 44.7 Brake and Accelerator Pedals

Brake Pedal

Non-adjustable brake pedal.

TS 44.8 Driver Foot Switches

Floor-Mounted Foot Control Platform

The angle of the turn signal platform shall be determined from a horizontal plane, regardless of the slope of the cab floor. The turn signal platform shall be angled at a minimum of 10 degrees and a maximum of 37 degrees. It shall be located no closer to the seat front than the heel point of the accelerator pedal.

Turn Signal Controls

Turn signal controls shall be floor-mounted, foot-controlled, water-resistant, heavy-duty, momentary contact switches.

Foot Switch Control

The foot switches shall be UL-listed, heavy-duty type, of a rugged, corrosion-resistant metal construction. The foot switches for the directionals shall be momentary type, while those for the public address (PA) system and the high beam shall be latching type. The spacing of the switches shall be such that inadvertent simultaneous deflection of switches is prevented.

Other Floor-Mounted Controls

May be floor-mounted with the similar requirements as the turn signal controls, but mounted differently in order for the driver to distinguish each one from one another.

- hazard
- silent alarm
- PA system

TS 45. Driver's Amenities

TS 45.1 Coat Hanger

A suitable hanger shall be installed in a convenient, approved location for the driver's coat.

TS 45.2 Drink Holder

A device shall be provided to securely hold the driver's drink container, which may vary widely in diameter. It must be mounted within easy reach of the driver and must have sufficient vertical clearance for easy removal of the container. When the container is in the device, the driver's view of the road must not be obstructed, and leakage from the container must not fall on any switches, gauges or controls.

TS 45.3 Storage Box

An enclosed driver storage area shall be provided with a positive latching door and/or lock. The minimum size is 2750 cubic inches.

TS 46. Windshield Wipers and Washers

TS 46.1 Windshield Wipers

The bus shall be equipped with a windshield wiper for each half of the windshield. At 60 mph, no more than 10 percent of the wiped area shall be lost due to windshield wiper lift. For two-piece windshields, both wipers shall park along the center edges of the windshield glass. For single-piece windshields, wipers shall park along the bottom edge of the windshield. Windshield wiper motors and mechanisms

shall be easily accessible for repairs or service. The fastener that secures the wiper arm to the drive mechanism shall be corrosion-resistant.

The windshield wiper shall be a single control, electric, two-speed, intermittent wiper.

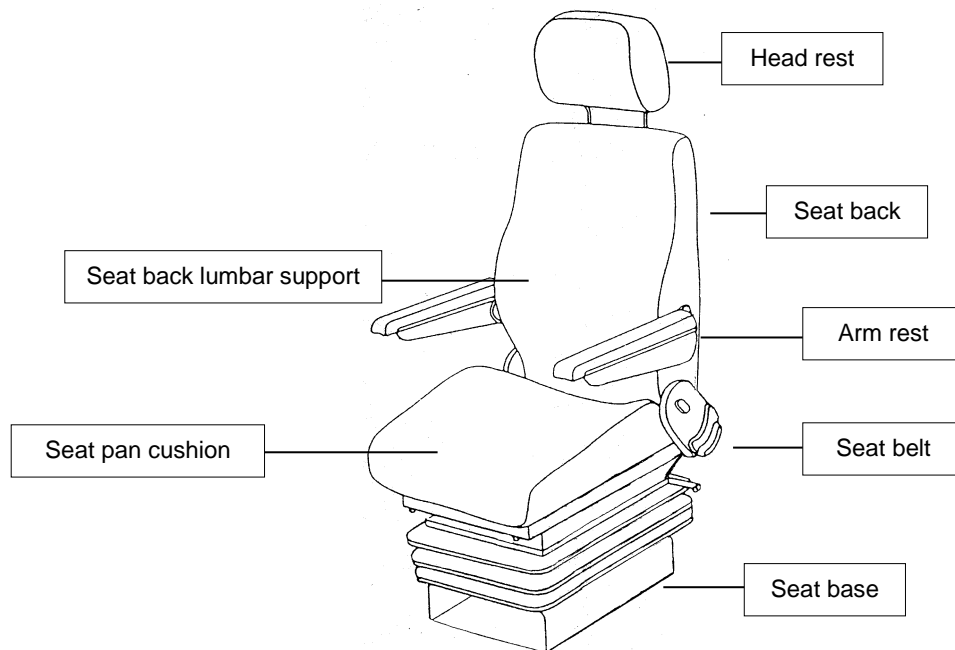
TS 46.2 Windshield Washers

The windshield washer system, when used with the wipers, shall deposit washing fluid evenly and completely wet the entire wiped area.

The windshield washer system shall have a minimum 3-gallon reservoir, located for easy refilling from outside of the bus. Reservoir pumps, lines and fittings shall be corrosion-resistant and must include a means to determine fluid level.

TS 47. Driver's Seat

FIGURE 6 (Reference Only)
Driver's Seat



TS 47.1 Dimensions

The driver's seat shall be comfortable and adjustable so that people ranging in size from a 95th-percentile male to a 5th-percentile female may operate the bus. TS 47.1.1 Seat Pan Cushion Length

Measurement shall be from the front edge of the seat pan to the rear at its intersection with the seat back. The adjustment of the seat pan length shall be no less than 16.5 inches at its minimum length and no more than 20.5 inches at its maximum length.

Seat Pan Cushion Height

Dimensions

Measurement shall be from the cab floor to the top of the level seat at its center midpoint. The seat shall adjust in height from a minimum of 14 inches, with a minimum 6 inches vertical range of adjustment.

TS 47.1.2 Seat Pan Cushion Slope

Measurement is the slope of the plane created by connecting the two high points of the seat, one at the rear of the seat at its intersection with the seat back and the other at the front of the seat just before it waterfalls downward at the edge. The slope can be measured using an inclinometer and shall be stated in degrees of incline relative to the horizontal plane (0 degrees). The seat pan shall adjust in its slope from no less than plus 12 degrees (rearward "bucket seat" incline), to no less than minus 5 degrees (forward slope).

TS 47.1.3 Seat Base Fore/Aft Adjustment

Measurement is the horizontal distance from the heel point to the front edge of the seat. The minimum and maximum distances shall be measured from the front edge of the seat when it is adjusted to its minimum seat pan depth (approximately 15 inches). On all low-floor buses, the seat-base shall travel horizontally a minimum of 9 inches. It shall adjust no closer to the heel point than 6 inches. On all high-floor buses, the seat base shall travel a minimum of 9 inches and adjust no closer to the heel-point than 6 inches.

Driver area depth is the horizontal distance from the heel-point to the barrier at the height at which the top of the seat back reclines. The driver area depth shall be a minimum of 45" and be able to accommodate the full range of seat adjustment and travel (for a seat with the specifications as described in these guidelines).

TS 47.1.4 Seat Pan Cushion Width

Measurement is the horizontal distance across the seat cushion. The seat pan cushion shall be 17 to 21 inches across at the front edge of the seat cushion and 20 to 23 inches across at the side bolsters.

TS 47.1.5 Seat Suspension

The driver's seat shall be appropriately dampened to support a minimum weight of 380 lbs. The suspension shall be capable of dampening adjustment in both directions.

Rubber snubbers shall be provided to prevent metal-to-metal contact.

TS 47.1.6 Seat Back

Width

Measurement is the distance between the outermost points of the front of the seat back, at or near its midpoint in height. The seat back width shall be no less than 19 inches. Seat back will include dual recliner gears on both sides of the seat.

TS 47.1.7 Height

Standard height seat back.

Headrests

No headrest.

TS 47.1.8 Seat Back Lumbar Support

Measurement is from the bottom of the seat back at its intersection with the seat pan to the top of the lumbar cushioning. The seat back shall provide adjustable depth lumbar back support with three individual operating lumbar cells within a minimum range of 7 to 11 inches.

TS 47.1.9 Seat Back Angle Adjustment

The seat back angle shall be measured relative to a level seat pan, where 90 degrees is the upright position and 90 degrees-plus represents the amount of recline.

The seat back shall adjust in angle from a minimum of no more than 90 degrees (upright) to at least 105 degrees (reclined), with infinite adjustment in between.

TS 47.2 Seat Belt

The belt assembly shall be an auto-locking retractor (ALR). All seat belts shall be stored in automatic retractors. The belts shall be mounted to the seat frame so that the driver may adjust the seat without resetting the seat belt.

The seat and seat belt assemblies as installed in the bus shall withstand static horizontal forces as required in FMVSS 207 and 210.

Lap seat belt only.

Seatbelt webbing shall be black in color.

Lap Belt Length

72 inches with Extension

The lap belt assembly shall be 72 inches in length with an 8-inch extension

TS 47.3 Adjustable Armrest

No armrests.

TS 47.4 Seat Control Locations

While seated, the driver shall be able to make seat adjustments by hand without complexity, excessive effort or being pinched. Adjustment mechanisms shall hold the adjustments and shall not be subject to inadvertent changes.

TS 47.5 Seat Structure and Materials

The operator's seat shall be contoured to provide maximum comfort for extended period of time. Cushions shall be fully padded with at least 3 inches of open-cell foam or material with equal properties, in the seating areas at the bottom and back. Upholstery shall be ventilated, transportation grade material.

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All visually exposed metal on the operator's seat, including the pedestal, shall be powder coated steel, unpainted aluminum or stainless steel.

The seat and seatbelt assemblies as installed in the bus shall withstand static horizontal forces as required in FMVSS 207 and 210. The seat shall withstand 10,000 impacts of a 40-pound sandbag dropped from a height of 12 inches without visible deterioration. The seat shall be tested in the lowest vertical position and repeated with the seat in the top vertical position.

The 40-pound sandbag shall be suspended on a 36-inch pendulum and shall strike the seat back 10,000 times from distances of 6, 8, 10, and 12 inches. Seat cushion shall withstand 100,000 randomly positioned 3 ½-inch drops of a squirming, 150-pound, smooth-surfaced, buttocks-shape striker with only minimal wear on the seat covering and no failures to seat structure or cushion suspension components.

At the request of GVI, the Bus Manufacturer shall provide a certified test report fully documenting compliance with all the requirements defined above. The test report shall contain a record of all testing activities, test diagrams, testing equipment, as well as test data related to loads, deflections and permanent deformation of the seat assembly. The report shall include a statement of compliance with the requirements of this section of Part 5: Technical Specifications.

The seat upholstery shall be black heavy duty transit vinyl.

TS 47.6 Pedestal

The pedestal shall be powder-coated steel, unpainted aluminum or stainless steel.

TS 47.7 Seat Options

None

TS 47.8 Mirrors

TS 47.8.1 Exterior Mirrors

The bus shall be equipped with a corrosion-resistant, outside rearview mirrors mounted with stable supports to minimize vibration. Mirrors shall be firmly attached to the bus to minimize vibration and to prevent loss of adjustment with a breakaway mounting system. Mirrors shall permit the driver to view the roadway along the sides of the bus, including the rear wheels. Mirrors should be positioned to prevent blind spots.

Mirrors shall retract or fold sufficiently to allow bus washing operations but avoid contact with windshield.

Flat Mirrors on Both Sides

The bus shall be equipped with two flat outside mirrors, each with not less than 50 square inches of reflective surface. The mirrors shall be located so as to provide the driver a view to the rear along both sides of the bus and shall be adjustable both in the horizontal and vertical directions to view the rearward scene. The roadside rearview mirror shall be positioned so that the driver's line of sight is not obstructed.

Curbside (Left Side) Mirrors

The curbside rearview mirror shall be mounted so that its lower edge is no less than 78 inches above the street surface.

Remote Adjustment of Curbside and Streetside Mirrors

The driver shall be able to adjust the curbside and streetside mirrors remotely while seated in the driving position. The control for remote positioning of the mirrors shall be a single switch or device.

TS 47.8.2 Interior Mirrors

Mirrors shall be provided for the driver to observe passengers throughout the bus without leaving the seat and without shoulder movement. The driver shall be able to observe passengers in the front/entrance and rear/exit areas, anywhere in the aisle, and in the rear seats.

WINDOWS

TS 48. General

A minimum of 6000 square inches of window area, including operator and door windows, shall be required on each side of the standard configuration bus.

TS 49. Windshield

The windshield shall permit an operator's field of view as referenced in SAE Recommended Practice J1050. The vertically upward view shall be a minimum of 14 degrees, measured above the horizontal and excluding any shaded band. The vertically downward view shall permit detection of an object 3½ ft high no more than 2 ft in front of the bus. The horizontal view shall be a minimum of 90 degrees above the line of sight. Any binocular obscuration due to a center divider may be ignored when determining the 90-degree requirement, provided that the divider does not exceed a 3-degree angle in the operator's field of view. Windshield pillars shall not exceed 10 degrees of binocular obscuration. The windshield shall be designed and installed to minimize external glare as well as reflections from inside the bus.

The windshield shall be easily replaceable by removing zip-locks from the windshield retaining moldings. Bonded-in-place windshields shall not be used. Winglets may be bonded.

TS 49.1 Glazing

The windshield glazing material shall have a ¼ inch nominal thickness laminated safety glass conforming to the requirements of ANSI Z26.1 Test Grouping 1A and the Recommended Practices defined in SAE J673.

The upper portion of the windshield above the driver's field of view shall have a dark, shaded band with a minimum luminous transmittance of 5 percent when tested in accordance to ASTM D-1003.

TS 50. Driver's Side Window

The driver's side window shall be the sliding type, requiring only the rear half of sash to latch upon closing, and shall open sufficiently to permit the seated operator to easily adjust the street-side outside rearview mirror. When in an open position, the window shall not rattle or close during braking. This window section shall slide in tracks or channels designed to last the service life of the bus. The operator's side window shall not be bonded in place and shall be easily replaceable. The glazing material shall have a single-density tint.

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The driver's view, perpendicular through operator's side window glazing, should extend a minimum of 33 inches (840 mm) to the rear of the heel point on the accelerator, and in any case must accommodate a 95th percentile male operator. The view through the glazing at the front of the assembly should begin not more than 26 inches (560 mm) above the operator's floor to ensure visibility of an under-mounted convex mirror. Driver's window construction shall maximize ability for full opening of the window.

The driver's side window glazing material shall have a ¼ inch nominal thickness laminated safety glass conforming with the requirements of ANSI Z26.1-1996 Test Grouping 2 and the Recommended Practices defined in SAE J673.

Light transmittance shall be 75 percent on the glass area below 53 inches from the operator platform floor. On the top fixed over bottom slider configuration, the top fixed area above 53 inches may have a maximum 5 percent light transmittance.

TS 51. Side Windows

TS 51.1 Configuration

Side windows shall not be bonded in place, but shall be easily replaceable without disturbing adjacent windows and shall be mounted so that flexing or vibration from engine operation or normal road excitation is not apparent. All aluminum and steel material will be treated to prevent corrosion.

TS 51.2 Emergency Exit (Egress) Configuration

Minimum Egress

All side windows shall be fixed in position, except as necessary to meet the emergency escape requirements.

TS 51.3 Configuration

Operable Side Window Configurations

All side windows, except windows in passenger doors and those smaller than 500 square inches, shall have window panels that are operable by passengers. Operable window panels shall be equipped with latches that secure the window in the fully open and fully closed positions.

Operable Windows with Operable Transom Panel and Sliding Lower Panels

Each operable side window shall incorporate an upper transom portion. The transom shall be between 25 and 35 percent of the total window area. The transom portion of the window shall be hinged at lower edge and open inward. The lower portion shall consist of two horizontally sliding panels.

TS 51.4 Materials

Safety Glass Glazing Panels

Side windows glazing material shall have a minimum of 3/16-inch nominal thickness tempered safety glass. The material shall conform to the requirements of ANSI Z26.1-1996 Test Grouping 2 and the Recommended Practices defined in SAE J673.

Windows on the bus sides and in the rear door shall be tinted a neutral color, complementary to the bus exterior. The maximum solar energy transmittance shall not exceed 37 percent, as measured by ASTM E-

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424. Luminous transmittance shall be measured by ASTM D-1003. Windows over the destination signs shall not be tinted.

55 percent luminous transmittance.

TS 51.5 Rear Window

No requirement for rear window.

HEATING, VENTILATING AND AIR CONDITIONING

TS 52. Capacity and Performance

The US Virgin Islands have a tropical marine climate tempered by steady Northeast trade winds. There is little seasonal temperature variation. Average daily low temperatures range from 72°F to 78 °F; average highs range from 86°F to 91°F. High humidity and high sun load, along with heavy passenger loading, put a strain on the air conditioning system. The design of the bus must consider these conditions.

The HVAC climate control system shall be capable of controlling the temperature and maintaining the humidity levels of the interior of the bus as defined in the following paragraphs.

Allow Either Roof- or Rear-Mounted HVAC Unit

The HVAC unit may either be roof or rear-mounted. Accessibility and serviceability of preventative maintenance components shall be provided, minimizing the maintenance personnel needed to work on the roof of the bus.

With the bus running at the design operating profile with corresponding door opening cycle, and carrying a number of passengers equal to 150 percent of the seated load, the HVAC system shall control the average passenger compartment temperature within a range between 65 and 80 °F, while maintaining the relative humidity to a value of 50 percent or less. The system shall maintain these conditions while subjected to any outside ambient temperatures within a range of 65 to 95 °F and at any ambient relative humidity levels between 5 and 50 percent.

Hotter Ambient Conditions

The air conditioning portion of the HVAC system shall be capable of reducing the passenger compartment temperature from 110 °F to 70 °F +/-3 °F in less than 30 minutes after system engagement for 30, 35 and 40-foot buses. Engine temperature shall be within the normal operating range at the time of start-up of the cool-down test, and the engine speed shall be limited to fast idle at ¾ max governed speed that may be activated by a driver-controlled device. During the cool-down period, the refrigerant pressure shall not exceed safe high-side pressures, and the condenser discharge air temperature, measured 6 inches from the surface of the coil, shall be less than 45 °F above the condenser inlet air temperature. No simulated solar load shall be used. There shall be no passengers on board, and the doors and windows shall be closed.

When the bus is operated in outside ambient temperatures of 95 to 115 °F, the interior temperature of the bus shall be permitted to rise 0.5° for each degree of exterior temperature in excess of 95 °F.

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System capacity testing, including pull-down/warm-up, stabilization and profile, shall be conducted in accordance to the APTA's "Recommended Instrumentation and Performance Testing for Transit Bus Air Conditioning System."

The recommended locations of temperature probes are only guidelines and may require slight modifications to address actual bus design. Care must be taken to avoid placement of sensing devices in the immediate path of an air duct outlet. In general, the locations are intended to accurately represent the interior passenger area.

Additional testing shall be performed as necessary to ensure compliance to performance requirements stated herein.

Bidder shall provide a certified third party performance test, which shows specifications are met. In lieu of providing a certified third party performance test the builder can supply testing information of the air conditioning system proposed from testing of the individual bus unit or other testing that was done by the air conditioning manufacturer at their plant to meet the requirements of this specification.

TS 53. Controls and Temperature Uniformity

The HVAC system excluding the driver's heater/defroster shall be centrally controlled with an advanced electronic/diagnostic control system with provisions for extracting/reading data. The system shall be compliant with J1939 Communication Protocol for receiving and broadcasting of data.

Hot engine coolant water shall be delivered to the HVAC system driver's defroster/heater and other heater cores by means of an auxiliary coolant pump, sized for the required flow, which is brushless and sealless having a minimum maintenance free service life for both the brushless motor and the pump of at least 40,000 hours at full power.

Manual Mode Selection of Climate Control System

After manual selection and/or activation of climate control system operation mode, all interior climate control system requirements for the selected mode shall be attained automatically to within ± 2 °F of specified temperature control set-point.

Interior temperature distribution shall be uniform to the extent practicable to prevent hot and/or cold spots. After stabilization with doors closed, the temperatures between any two points in the passenger compartment in the same vertical plane, and 6 to 72 inches above the floor, shall not vary by more than 5 °F with doors closed. The interior temperatures, measured at the same height above the floor, shall not vary more than ± 5 °F from the front to the rear from the average temperature determined in accordance with APTA's "Recommended Instrumentation and Performance Testing for Transit Bus Air Conditioning System." Variations of greater than ± 5 °F will be allowed for limited, localized areas provided the majority of the measured temperatures fall within the specified requirement.

TS 54. Air Flow

TS 54.1 Passenger Area

The cooling mode of the interior climate control system shall introduce air into the bus at or near the ceiling height at a minimum rate of 25 cubic ft per minute (cfm) per passenger based on the standard configuration bus carrying a number of passengers equal to 150 percent of the seated load. Airflow shall

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be evenly distributed throughout the bus, with air velocity not exceeding 100 ft per minute on any passenger. The ventilating mode shall provide air at a minimum flow rate of 20 cfm per passenger.

Airflow may be reduced to 15 cfm per passenger (150 percent of seated load) when operating in the heating mode. The fans shall not activate until the heating element has warmed sufficiently to ensure at least 70 °F air outlet temperature. The heating air outlet temperature shall not exceed 120 °F under any normal operating conditions.

The climate control blower motors and fan shall be designed such that their operation complies with the interior noise level requirements.

TS 54.2 Driver's Area

The bus interior climate control system shall deliver at least 100 cfm of air to the driver's area when operating in the ventilating and cooling modes. Adjustable nozzles shall permit variable distribution or shutdown of the airflow. Airflow in the heating mode shall be reduced proportionally to the reduction of airflow into the passenger area. The windshield defroster unit shall meet the requirements of SAE Recommended Practice J382, "Windshield Defrosting Systems Performance Requirements," and shall have the capability of diverting heated air to the driver's feet and legs. The defroster or interior climate control system shall maintain visibility through the driver's side window.

TS 54.3 Controls for the Climate Control System (CCS)

The controls for the driver's compartment for heating, ventilation and cooling systems shall be integrated and shall meet the following requirements:

- The heat/defrost system fan shall be controlled by a separate switch that has an "off" position and at least two positions for speed control. All switches and controls shall preclude the possibility of clothing becoming entangled, and shields shall be provided, if required. If the fans are approved by the GVI, an "on-off" switch shall be located to the right of or near the main defroster switch.
- A manually operated control valve shall control the coolant flow through the heater core.
- If a cable-operated manual control valve is used, the cable length shall be kept to a minimum to reduce cable seizing. Heater water control valves shall be "positive" type, closed or open. The method of operating remote valves shall require the concurrence of the GVI project manager.

TS 54.4 Driver's Compartment Requirements

A separate heating, ventilation and defroster system for the driver's area shall be provided and shall be controlled by the driver. The system shall meet the following requirements:

- The heater and defroster system shall provide heating for the driver and heated air to completely defrost and defog the windshield, driver's side window, and the front door glasses in all operating conditions. Fan(s) shall be able to draw air from the bus body interior and/or the exterior through a control device and pass it through the heater core to the defroster system and over the driver's feet. A minimum capacity of 100 cfm shall be provided. The driver shall have complete control of the heat and fresh airflow for the driver's area.
- The defroster supply outlets shall be located at the lower edge of the windshield. These outlets shall be durable and shall be free of sharp edges that can catch clothes during normal daily cleaning. The system shall be such that foreign objects such as coins or tickets cannot fall into the defroster air outlets. Adjustable ball vents or louvers shall be provided at the left of the driver's position to allow direction of air onto the side windows.

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A ventilation system shall be provided to ensure driver comfort and shall be capable of providing fresh air in both the foot and head areas. Vents shall be controllable by the driver from the normal driving position. Decals shall be provided, indicating “operating instructions” and “open” and “closed” positions. When closed, vents shall be sealed to prevent the migration of water or air into the bus.

TS 54.5 Driver’s Cooling

A separate fan unit or booster blower shall provide 100 cfm of air to the driver’s area through directionally adjustable nozzles and an variable fan control, both of which shall be located above and ahead of the driver.

TS 55. Air Filtration

Air shall be filtered before discharge into the passenger compartment. The filter shall meet the ANSI/ASHRAE 52.1 requirement for 5 percent or better atmospheric dust spot efficiency, 50 percent weight arrestance, and a minimum dust holding capacity of 120 g per 1000 cfm cell. Air filters shall be easily removable for service.

Disposable Type Filters

Air filters shall be of disposable type.

TS 56. Roof Ventilators

Two Roof Ventilators

Two roof ventilators shall be provided in the roof of the bus, one approximately over or just forward of the front axle and the other approximately over the rear axle.

Each ventilator shall be easily opened and closed manually. When open with the bus in motion, this ventilator shall provide fresh air inside the bus. The ventilator shall cover an opening area no less than 425 square inches and shall be capable of being positioned as a scoop with either the leading or trailing edge open no less than 4 inches, or with all four edges raised simultaneously to a height of no less than 3½ inches. An escape hatch shall be incorporated into the roof ventilator. Roof ventilator(s) shall be sealed to prevent entry of water when closed.

Each ventilator shall be easily opened and closed manually by a 5th percentile female. If roof ventilator(s) cannot be reached by a 5th percentile female, then a tool shall be provided to allow this.

TS 57. Maintainability

Manually controlled shut-off valves in the refrigerant lines shall allow isolation of the compressor and dehydrator filter for service. To the extent practicable, self-sealing couplings utilizing O-ring seals shall be used to break and seal the refrigerant lines during removal of major components, such as the refrigerant compressor. Shut-off valves may be provided in lieu of self-sealing couplings. The condenser shall be located to efficiently transfer heat to the atmosphere and shall not ingest air warmed above the ambient temperature by the bus mechanical equipment, or to discharge air into any other system of the bus. The location of the condenser shall preclude its obstruction by wheel splash, road dirt or debris. HVAC components located within 6 inches of floor level shall be constructed to resist damage and corrosion.

TS 58. Entrance/exit area heating – not used

TS 59. Floor-Level Heating – not used

EXTERIOR PANELS, FINISHES AND EXTERIOR LIGHTING

TS 60. Design

The bus shall have a clean, smooth, simple design, primarily derived from bus performance requirements and passenger service criteria. The exterior and body features, including grilles and louvers, shall be shaped to facilitate cleaning by automatic bus washers without snagging washer brushes. Water and dirt shall not be retained in or on any body feature to freeze or bleed out onto the bus after leaving the washer. The body and windows shall be sealed to prevent leaking of air, dust or water under normal operating conditions and during cleaning in automatic bus washers for the service life of the bus.

Exterior panels shall be sufficiently stiff to minimize vibration, drumming or flexing while the bus is in service. When panels are lapped, the upper and forward panels shall act as a watershed. However, if entry of moisture into the interior of the vehicle is prevented by other means, then rear cap panels may be lapped otherwise. The windows, hatches and doors shall be able to be sealed. Accumulation of spray and splash generated by the bus's wheels shall be minimized on windows and mirrors.

TS 60.1 Materials

Body materials shall be selected and the body fabricated to reduce maintenance, extend durability and provide consistency of appearance throughout the service life of the bus. Detailing shall be kept simple, and add-on devices and trim shall be minimized and integrated into the basic design.

TS 60.2 Roof-Mounted Equipment

A non-skid, clearly marked walkway or steps shall be incorporated on the roof to provide access to equipment without damaging any system or bus paneling.

TS 61. Pedestrian Safety

Exterior protrusions along the side and front of the bus greater than ½ inch and within 80 inches of the ground shall have a radius no less than the amount of the protrusion. The exterior rearview mirrors, cameras and required lights and reflectors are exempt from the protrusion requirement. Advertising frames shall protrude no more than ⅞ inch from the body surface. Grilles, doors, bumpers and other features on the sides and rear of the bus shall be designed to minimize toeholds or handholds.

Exterior protrusions shall not cause a line-of-sight blockage for the driver.

TS 62. Repair and Replacement

TS 62.1 Side Body Panels

Structural elements supporting exterior body panels shall allow side body panels below the windows to be repaired in lengths not greater than 12.5 ft.

Easily Replaceable Lower Side Body Panels

The lower section (approximately 17.5 inches) of the side body panels (low-floor buses) or skirt panels (high-floor buses) shall be made of impact-resistant material and shall be easily and quickly replaceable.

TS 63. Rain Gutters

Rain gutters shall be provided to prevent water flowing from the roof onto the passenger doors and driver's side window. When the bus is decelerated, the gutters shall not drain onto the windshield, driver's side window or door boarding area. Cross-sections of the gutters shall be adequate for proper operation.

Rain gutter shall also be provided above passenger side windows.

TS 64. License Plate Provisions

Provisions shall be made to mount standard-size U.S./Canada license plates per SAE J686 on the front and rear of the bus. These provisions shall direct-mount or recess the license plates so that they can be cleaned by automatic bus-washing equipment without being caught by the brushes. The rear license plate provision shall be illuminated per SAE J587.

TS 64.1 Rub Rails

Requirement for Rub Rails

Rub rails composed of flexible, resilient material shall be provided to protect both sides of the bus body from damage caused by minor sideswipe accidents with automobiles. Rub rails shall have vertical dimensions of no less than 2 inches (50 mm) with the centerline no higher than 35 inches above the ground between the wheel wells. The rub rails shall withstand impacts of 200 ft-lbs of energy from a steel-faced spherical missile no less than 9 inches in diameter and of a 500 lb load applied anywhere along their length by a rigid plate 1 ft in length, wider than the rub rail, and with a ¼ inch end radii, with no visible damage to the rub rail, retainer or supporting structure.

The rub rail may be discontinued at doorways and wheel wells. A damaged portion of the rub rail shall be replaceable without requiring removal or replacement of the entire rub rail.

NOTE: Installation of rub rails may preclude the installation and or size of exterior advertising signs or racks.

TS 65. Fender Skirts

Features to minimize water spray from the bus in wet conditions shall be included in wheel housing design. Any fender skirts shall be easily replaceable. They shall be flexible if they extend beyond the allowable body width. Wheels and tires shall be removable with the fender skirts in place.

TS 66. Wheel covers – not used

TS 66.1 Splash Aprons

Splash aprons, composed of ¼ inch minimum composition or rubberized fabric, shall be installed behind and/or in front of wheels as needed to reduce road splash and protect underfloor components. The splash

aprons shall extend downward to within 6 inches off the road surface at static conditions. Apron widths shall be no less than tire widths. Splash aprons shall be bolted to the bus understructure. Splash aprons and their attachments shall be inherently weaker than the structure to which they are attached. The flexible portions of the splash aprons shall not be included in the road clearance measurements. Splash apron shall be installed as necessary to protect the wheelchair loading device from road splash. Other splash aprons shall be installed where necessary to protect bus equipment.

TS 67. Service Compartments and Access Doors

TS 67.1 Access Doors

Conventional or pantograph hinged doors shall be used for the engine compartment and for all auxiliary equipment compartments including doors for checking the quantity and adding to the engine coolant, engine lubricant and transmission fluid. Access openings shall be sized for easy performance of tasks within the compartment, including tool operating space. Access doors shall be of rugged construction and shall maintain mechanical integrity and function under normal operations throughout the service life of the bus. They shall close flush with the body surface. All doors shall be hinged at the top or on the forward edge and shall be prevented from coming loose or opening during transit service or in bus washing operations. All access doors shall be retained in the open position by props or counterbalancing with over-center or gas-filled springs with safety props and shall be easily operable by one person. Springs and hinges shall be corrosion resistant. Latch handles shall be flush with, or recessed behind, the body contour and shall be sized to provide an adequate grip for opening. Access doors, when opened, shall not restrict access for servicing other components or systems.

If precluded by design, the manufacturer shall provide door design information specifying how the requirements are met.

TS 67.2 Access Door Latch/Locks

Requirement for Latches on Access Doors

Access doors larger than 100 square inches in area shall be equipped with corrosion-resistant flush-mounted latches or locks except for coolant and fuel fill access doors. The latches shall be standardized and shall be openable without the use of a key or tool.

TS 68. Bumpers

TS 68.1 Location

Bumpers shall provide impact protection for the front and rear of the bus with the top of the bumper being 27 inches, \pm 2 inches, above the ground. Bumper height shall be such that when one bus is parked behind another, a portion of the bumper faces will contact each other.

TS 68.2 Front Bumper

No part of the bus, including the bumper, shall be damaged as a result of a 5 mph impact of the bus at curb weight with a fixed, flat barrier perpendicular to the bus's longitudinal centerline. The bumper shall return to its pre-impact shape within 10 minutes of the impact. The bumper shall protect the bus from damage as a result of 6.5 mph impacts at any point by the common carriage with contoured impact surface defined in Figure 2 of FMVSS 301 loaded to 4000 lbs parallel to the longitudinal centerline of the bus. It shall protect the bus from damage as a result of 5.5 mph impacts into the corners at a 30-degree angle to the longitudinal centerline of the bus. The energy absorption system of the bumper shall be

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independent of every power system of the bus and shall not require service or maintenance in normal operation during the service life of the bus. The bumper may increase the overall bus length specified by no more than 7 inches.

TS 68.3 Rear Bumper

No part of the bus, including the bumper, shall be damaged as a result of a 2 mph impact with a fixed, flat barrier perpendicular to the longitudinal centerline of the bus. The bumper shall return to its pre-impact shape within 10 minutes of the impact. When using a yard tug with a smooth, flat plate bumper 2 ft wide contacting the horizontal centerline of the rear bumper, the bumper shall provide protection at speeds up to 5 mph, over pavement discontinuities up to 1 inch high, and at accelerations up to 2 mph/sec. The rear bumper shall protect the bus, when impacted anywhere along its width by the common carriage with contoured impact surface defined in Figure 2 of FMVSS 301 loaded to 4000 lbs, at 4 mph parallel to or up to a 30-degree angle to, the longitudinal centerline of the bus. The rear bumper shall be shaped to preclude unauthorized riders standing on the bumper. The bumper shall not require service or maintenance in normal operation during the service life of the bus. The bumper may increase the overall bus length specified by no more than 7 inches.

TS 68.4 Bumper Material

Bumper material shall be corrosion-resistant and withstand repeated impacts of the specified loads without sustaining damage. Visible surfaces shall be black. These bumper qualities shall be sustained throughout the service life of the bus.

TS 69. Finish and Color

TS 69.1 Appearance

Exterior painted surfaces shall be finished in DuPont Imron or PPG DGHS or PPG – Delfleet Paint system. The color scheme shall be that the entire vehicle will be painted #102 white with flat black around the window frames. See Attachment 1 for layout and colors

All exterior surfaces shall be smooth and free of wrinkles and dents. Exterior surfaces to be painted shall be properly prepared as required by the paint system Supplier prior to application of paint to assure a proper bond between the basic surface and successive coats of original paint for the service life of the bus. Drilled holes and cutouts in exterior surfaces shall be made prior to cleaning, priming and painting, where possible, to prevent corrosion. The bus shall be completely painted prior to installation of exterior lights, windows, mirrors and other items that are applied to the exterior of the bus. Body filler materials may be used for surface dressing, but not for repair of damaged or improperly fitted panels.

Paint shall be applied smoothly and evenly with the finished surface free of visible dirt and the following other imperfections:

- blisters or bubbles appearing in the topcoat film
- chips, scratches, or gouges of the surface finish
- cracks in the paint film
- craters where paint failed to cover due to surface contamination
- overspray
- peeling
- runs or sags from excessive flow and failure to adhere uniformly to the surface
- chemical stains and water spots

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- dry patch due to incorrect mixing of paint activators
- buffing swirls

To the degree consistent with industry standards for commercial vehicle finishes, painted surfaces shall have gloss, and orange peel shall be minimized. All exterior finished surfaces shall be impervious to diesel fuel, gasoline and commercial cleaning agents. Finished surfaces shall resist damage by controlled applications of commonly used graffiti-removing chemicals.

Proper adhesion between the basic surface and successive coats of the original paint shall be measured using an Elcometer adhesion tester as outlined in ASTM D4541-85. Adhesion shall be a minimum 300 ft-lbs. The bus manufacturer shall supply test samples of the exterior surface for each step of the painting process that may be subject to adhesion testing per ASTM G4541-87 and ASTM D4145-85. ASTM D4541-93 may be used for inspection testing during assembly of the vehicle.

TS 70. Decals, Numbering and Signing

Monograms, numbers and other special signing shall be applied to the inside and outside of the bus as required. Signs shall be durable and fade-, chip- and peel-resistant. They may be painted signs, decals or pressure-sensitive appliques. All decals shall be installed per the decal Supplier recommendations. Signs shall be provided in compliance with the ADA requirements defined in 49 CFR Part, Subpart B, 38.27.

All other safety related signs should be included. Final selection will be made during a design review. Bus numbers should be 4 ½ inch high on all four sides of the bus. They shall start with Number 063 and continue up.

The GVI will provide the exact wording, size, color, and locations for specified signs and decals.

TS 70.1 Passenger Information

ADA priority seating signs as required and defined by 49 CFR, Part 38.27 shall be provided to identify the seats designated for passengers with disabilities.

Requirements for a public information system in accordance with 49 CFR, Part 38.35 shall be provided.

Requirements for a stop-request passenger signal in accordance with 49 CFR, Part 38.37 shall be provided as required in Section TS 82, Passenger Stop Request/Exit Signal.

Requirements for exterior destination signs in accordance with 49 CFR, Part 38.39 shall be provided as required in Section TS 80, Destination Signs.

TS 71. Exterior Lighting

Exterior lighting and reflectors shall comply, as applicable, with Part 393, Subpart B of the FMCSA and FMVSS 108.

All exterior lights shall be designed to prevent entry and accumulation of moisture or dust. Commercially available LED-type lamps shall be utilized at all exterior lamp locations except headlights. Lamps, lenses and fixtures shall be interchangeable to the extent practicable. Two hazard lamps at the rear of the bus shall be visible from behind when the engine service doors are opened. Light lenses shall be designed and located to prevent damage when running the vehicle through an automatic bus washer. Front marker

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(clearance) lights along with lights located on the roof and sides of the bus shall have protective shields or be of the flush mount type to protect the lens against minor impacts.

Standard Size

Size of LED lamps used for tail, brake and turn signal lamps shall be standard installation of OEM.

Potted Lamps

LED lamps shall be potted type and designed to last the life of the bus.

TS 71.1 Backup Light/Alarm

Visible and audible warnings shall inform following vehicles or pedestrians of reverse operation. Visible reverse operation warning shall conform to SAE Standard J593. Audible reverse operation warning shall conform to SAE Recommended Practice J994 Type C or D.

TS 71.2 Doorway Lighting

Lamps at the front and rear passenger doorways shall comply with ADA requirements and shall activate only when the doors open. These lamps shall illuminate the street surface to a level of no less than 1 foot-candle for a distance of 3 ft outward from the outboard edge of the door threshold. The lights may be positioned above or below the lower daylight opening of the windows and shall be shielded to protect passengers' eyes from glare.

TS 71.3 Turn Signals

Standard Turn Signals

Turn-signal lights shall be provided on the front, rear, curb and street sides of the bus in accordance with FMVSS 108 and Part 393, Subpart B of the FMCSA as applicable.

TS 71.4 Headlights

Headlamps shall be designed for replacement without removing the headlamp bezel.

Standard Installation

Standard OEM headlight installation shall be provided in accordance with FMVSS 108 and Part 393, Subpart B of the FMCSA as applicable.

TS 71.5 Brake Lights

Brake lights shall be provided in accordance with FMVSS 108 and Part 393, Subpart B of the FMCSA as applicable.

No High/Center Mount Brake Lamp or Deceleration Warning Lamps

Bus shall not include a high/center mount brake lamp and/or deceleration warning indicator lamps.

TS 71.6 Service Area Lighting (Interior and Exterior)

LED lamps shall be provided in the engine and all other compartments where service may be required to generally illuminate the area for night emergency repairs or adjustments. These service areas shall include, but not be limited to, the engine compartment, the communication box, junction/apparatus panels and

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passenger door operator compartments. Lighting shall be adequate to light the space of the service areas to levels needed to complete typical emergency repairs and adjustments. The service area lamps shall be suitable for the environment in which they are mounted.

Engine compartment lamps shall be controlled by a switch mounted near the rear start controls. All other service area lamps shall be controlled by switches mounted on or convenient to the lamp assemblies. Power to the service area lighting shall be programmable. Power shall latch on with activation of the switch and shall be automatically discontinued (timed out) after 30 minutes to prevent damage caused by inadvertently leaving the service area lighting switch in the on position after repairs are made.

INTERIOR PANELS AND FINISHES

TS 72. General Requirements

Materials shall be selected on the basis of maintenance, durability, appearance, safety, flammability and tactile qualities. Materials shall be strong enough to resist everyday abuse and be vandalism and corrosion resistant. Trim and attachment details shall be kept simple and unobtrusive. Interior trim shall be secured to avoid resonant vibrations under normal operational conditions.

Interior surfaces more than 10 inches below the lower edge of the side windows or windshield shall be shaped so that objects placed on them fall to the floor when the coach is parked on a level surface. Any components and other electrical components within close proximity to these surfaces shall also be resistant to this cleaning method.

The entire interior of the bus aft of the white standee line (except flooring, glazing and unfinished stainless steel) shall be coated with anti-graffiti clear polyurethane. All interior decals shall be installed prior to application of the polyurethane clear coat. Approved coating materials are: Deft 03-X-28, 03-X-28/CAT, Chem Creations U-1005 and U-1001, DuPont EZ 3440S clear coat and DuPont 193S activator and DuPont EZ3460S clear coat and DuPont EZ3461S activator.

TS 73. Interior Panels

Interior side-trim panels and operator's barrier shall be scratch-resistant plastic or melamine-type material.

Panels shall be easily replaceable and tamper-resistant. They shall be reinforced, as necessary, to resist vandalism and other rigors of transit bus service. Individual trim panels and parts shall be interchangeable to the extent practicable.

Fire Resistance

Materials shall comply with the Recommended Fire Safety Practices defined in FTA Docket 90-A, dated October 20, 1993.

TS 73.1 Driver Area Barrier

A barrier or bulkhead between the driver and the street-side front passenger seat shall be provided. The barrier shall minimize glare and reflections in the windshield directly in front of the barrier from interior lighting during night operation. Location and shape must permit full seat travel and reclining possibilities that can accommodate the shoulders of a 95th-percentile male. The partition shall have a side return and stanchion to prevent passenger from reaching the driver by standing behind the driver's seat. The lower

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area between the seat and panel must be accessible to the driver. The partition must be strong enough in conjunction with entire partition assembly for mounting of such equipment as flare kits, fire extinguishers (1.2 kg), microcomputer, public address amplifier, etc. Dark or black panels are preferred behind the driver's head. The panel should be isolated for noise control and attached with rubber grommets.

Wheel-Well-to-Ceiling Configuration of Driver's Barrier

The driver's barrier shall extend from the top of the wheel well to the ceiling the level of the seated driver and shall fit close to the bus side windows and wall to prevent passengers from reaching the driver or the driver's personal effects.

TS 73.2 Modesty Panels

Sturdy divider panels constructed of durable, unpainted, corrosion-resistant material complementing the interior shall be provided to act as both a physical and visual barrier for seated passengers.

Design and installation of modesty panels located in front of forward-facing seats shall include a handhold or grab handle along its top edge. These dividers shall be mounted on the sidewall and shall project toward the aisle no farther than passenger knee projection in longitudinal seats or the aisle side of the transverse seats. Modesty panels shall extend from at least the window opening of the side windows, and those forward of transverse seats shall extend downward to 1 and 1½ inches above the floor. Panels forward of longitudinal seats shall extend to below the level of the seat cushion. Dividers positioned at the doorways shall provide no less than a 2½ inches clearance between the modesty panel and a fully open, inward opening door, or the path of a deploying flip-out ramp to protect passengers from being pinched. Modesty panels installed at doorways shall be equipped with grab rails if passengers assist are not provided by other means.

The modesty panel and its mounting shall withstand a static force of 250 lbs applied to a 4×4-inch-area in the center of the panel without permanent visible deformation.

TS 73.3 Front End

The entire front end of the bus shall be sealed to prevent debris accumulation behind the dash and to prevent the driver's feet from kicking or fouling wiring and other equipment. The front end shall be free of protrusions that are hazardous to passengers standing at the front of the standee line area of the bus during rapid decelerations. Paneling across the front of the bus and any trim around the driver's compartment shall be formed metal or composite material. Composite dash panels shall be reinforced as necessary, vandal-resistant and replaceable. All colored, painted and plated parts forward of the driver's barrier shall be finished with a surface that reduces glare. Any mounted equipment must have provision to support the weight of equipment.

TS 73.4 Rear Bulkhead

The rear bulkhead and rear interior surfaces shall be material suitable for exterior skin; painted and finished to exterior quality; or paneled with melamine-type material, composite, scratch-resistant plastic or carpeting and trimmed with stainless steel, aluminum or composite.

The rear bulkhead paneling shall be contoured to fit the ceiling, side walls and seat backs so that any litter or trash will tend to fall to the floor or seating surface when the bus is on a level surface. Any air vents in this area shall be louvered to reduce airflow noise and to reduce the probability of trash or liter being thrown or drawn through the grille. If it is necessary to remove the panel to service components located on the rear bulkhead, the panel shall be hinged or shall be able to be easily removed and replaced. Grilles

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where access to or adjustment of equipment is required shall be heavy-duty and designed to minimize damage and limit unauthorized access.

TS 73.5 Headlining

Ceiling panels shall be made of durable, corrosion resistant, easily cleanable material. Headlining shall be supported to prevent buckling, drumming or flexing and shall be secured without loose edges. Headlining materials shall be treated or insulated to prevent marks due to condensation where panels are in contact with metal members. Moldings and trim strips, as required to make the edges tamperproof, shall be stainless steel, aluminum or plastic, colored to complement the ceiling material. Headlining panels covering operational equipment that is mounted above the ceiling shall be on hinges for ease of service but retained to prevent inadvertent opening.

TS 73.6 Fastening

Interior panels shall be attached so that there are no exposed unfinished or rough edges or rough surfaces. Fasteners should be corrosion resistant. Panels and fasteners shall not be easily removable by passengers. Exposed interior fasteners should be minimized, and where required shall be tamper-resistant.

TS 73.7 Insulation

Any insulation material used between the inner and outer panels shall minimize the entry and/or retention of moisture. Insulation properties shall be unimpaired during the service life of the bus. Any insulation material used inside the engine compartment shall not absorb or retain oils or water and shall be designed to prevent casual damage that may occur during maintenance operations.

The combination of inner and outer panels on the sides, roof, wheel wells and ends of the bus, and any material used between these panels, shall provide a thermal insulation sufficient to meet the interior temperature requirements. The bus body shall be thoroughly sealed so that the driver or passengers cannot feel drafts during normal operations with the passenger doors closed.

FTA Docket 90-A

All insulation materials shall comply with the Recommended Fire Safety Practices defined in FTA Docket 90-A, dated October 20, 1993.

TS 73.8 Floor Covering

The floor rubber shall be RCA Rubber Company, Transit –Flor, Black #/16” ribbed and 1/8” black smooth.

The floor covering shall have a non-skid walking surface that remains effective in all weather conditions. The floor covering, as well as transitions of flooring material to the main floor and to the entrance and exit area, shall be smooth and present no tripping hazards. Seams shall be sealed/welded per manufacturer’s specifications. The standee line shall be approximately 2 inches wide and shall extend across the bus aisle. The color and pattern shall be consistent throughout the floor covering.

Additional Requirements

Any areas on the floor that are not intended for standees, such as areas “swept” during passenger door operation, shall be clearly and permanently marked.

The floor shall be easily cleaned and shall be arranged to minimize debris accumulation.

A one-piece center strip shall extend from the vertical wall of the rear settee between the aisle sides of transverse seats to the standee line. If the floor is of a bi-level construction, then the center strip shall be one piece at each level. The covering between the center strip and the wheel housings may be separate pieces. At the rear door, however, a separate strip as wide as the door shall extend from the center strip to the outboard edge of the rear/exit area.

The floor under the seats shall be covered with smooth surface flooring material. The floor covering shall closely fit the sidewall in a fully sealed butt joint or extend to the top of the cove.

TS 73.9 Interior Lighting

The light source shall be located to minimize windshield glare, with distribution of the light focused primarily on the passengers' reading plane while casting sufficient light onto the advertising display. The lighting system may be designed to form part of or the entire air distribution duct.

The lens material shall be translucent polycarbonate. Lenses shall be designed to effectively "mask" the light source. Lenses shall be sealed to inhibit incursion of dust and insects yet be easily removable for service. Access panels shall be provided to allow servicing of components located behind light panels. If necessary, the entire light fixture shall be hinged.

If threaded fasteners are used they must be held captive in the lens.

TS 73.10 Passenger Lighting

Interior lighting shall be LED lights.

Automatically Dimming First Row Lights

The first light on each side (behind the driver and the front door) is normally turned on only when the front door is opened, in "night run" and "night park." As soon as the door closes, these lights shall go out. These lights shall be turned on at any time if the toggle switch is in the "on" position.

Dimming Second Row Lights

To help eliminate windshield reflection on suburban roads where street lighting is at a low level, the second light on each side, when "night run" or "night park" is selected, shall be controlled by the toggle switch; off in "off" and on in "normal." These lights shall be turned on at any time if the toggle switch is in the "on" position.

All interior lighting shall be turned off whenever the transmission selector is in reverse and the engine run switch is in the "on" position.

The interior lighting design shall require the approval of the GVI.

TS 73.11 Driver Area

The driver's area shall have a light to provide general illumination, and it shall illuminate the half of the steering wheel nearest the driver to a level of 5 to 10 foot-candles.

TS 73.12 Seating Areas

The interior lighting system shall provide a minimum 15 foot-candle illumination on a 1 sq ft plane at an angle of 45 degrees from horizontal, centered 33 inches above the floor and 24 inches in front of the seat back at each seat position. Allowable average light level for the rear bench seats shall be 7 foot-candles.

TS 73.13 Vestibules/Doors

Floor surface in the aisles shall be a minimum of 10 foot-candles, and the vestibule area a minimum of 4 foot-candles with the front doors open and a minimum of 2 foot-candles with the front doors closed. The front entrance area and curb lights shall illuminate when the front door is open and master run switch is in the “lights” positions. Rear exit area and curb lights shall illuminate when the rear door is unlocked.

TS 73.14 Step Lighting

Step lighting for the intermediate steps between lower and upper floor levels shall be a minimum of 4 foot-candles and shall illuminate in all engine run positions. The step lighting shall be low-profile to minimize tripping and snagging hazards for passengers and shall be shielded as necessary to protect passengers’ eyes from glare.

TS 73.15 Ramp Lighting

Exterior and interior ramp lighting shall comply with CFR Part 49, Sections 19.29 and 19.31.

TS 73.16 Turntable Lighting – not used

TS 73.17 Farebox Lighting

A light fixture shall be mounted in the ceiling above the farebox location. The fixture shall be capable of projecting a concentrated beam of light on the farebox. This light will automatically come on whenever the front doors are opened and the run switch is in the “night run” or “night park” position.

TS 74. Fare Collection

Space and structural provisions shall be made for installation of currently available fare collection devices and shall be as far forward as practicable. Location of the fare collection device shall not restrict traffic in the vestibule, including wheelchairs if a front door loading device is used, and shall allow the driver to easily reach the farebox controls and to view the fare register. The fare box shall not restrict access to the driver area, shall not restrict operation of driver controls and shall not — either by itself or in combination with stanchions, transfer mounting, cutting and punching equipment, or route destination signs — restrict the driver’s field of view per SAE Recommended Practice J1050. The location and mounting of the fare collection device shall allow use, without restriction, by passengers. The fare box location shall permit accessibility to the vault for easy manual removal or attachment of suction devices. Meters and counters on the fare box shall be readable on a daily basis. The floor under the fare box shall be reinforced as necessary to provide a sturdy mounting platform and to prevent shaking of the fare box.

Transfer mounting, cutting and punching equipment is not required.
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The GVI will specify and supply a fare box for the Contractor to install.

TS 75. Interior Access Panels and Doors

Access for maintenance and replacement of equipment shall be provided by panels and doors that appear to be an integral part of the interior. Access doors shall be hinged with gas props or over-center springs, where practical, to hold the doors out of the mechanic's way. Panels shall prevent entry of mechanism lubricant into the bus interior. All fasteners that retain access panels shall be captive in the cover.

Access Doors that Do Not Require Tools or Keys to Open

Access doors shall be secured with hand screws or latches. All fasteners that retain access panels shall be captive in the cover.

Access Doors with Locks

Access doors for the door actuator compartments shall be secured with locks, and shall prevent entry of mechanism lubricant into the bus interior. The locks shall be standardized so that only one tool, as required in Section 5.4.3.8.1, is required to open access doors on the bus.

TS 75.1 Floor Panels

Access openings in the floor shall be sealed to prevent entry of fumes and water into the bus interior. Flooring material at or around access openings shall be flush with the floor and shall be edge-bound with stainless steel or another material that is acceptable to the GVI to prevent the edges from coming loose. Access openings shall be asymmetrical so that reinstalled flooring shall be properly aligned. Fasteners shall tighten flush with the floor.

The number of special fastener tools required for panel and access door fasteners shall be minimized.

PASSENGER ACCOMMODATIONS

TS 76. Passenger Seating

TS 76.1 Arrangements and Seat Style

The passenger seating arrangement in the bus shall be such that seating capacity is maximized and in compliance to the following requirements.

Note: The GVI recognizes that ramp location, foot room, hip-to-knee room, doorway type, width, seat construction, floor level type, seat spacing requirements, ramp or lift, number of wheelchair positions, etc., ultimately affect seating capacity and layout.

Combination Forward-Facing and Perimeter Seating Arrangement

Passenger seats shall be arranged in longitudinal rows, including folding seats in the wheelchair positions, facing the centerline at the front section of the bus and transverse, two-position forward-facing seating at the rear section of the bus, with one row of transverse, forward facing seats at the rear of the bus. Each seat shall have a minimum width of 17 inches, not including any armrest. Some seats may be less than 17 inches to maximize seating capacity, which shall be no less than 26 seated passengers, not including the driver.

The Contractor shall provide the proposed seating layout showing footroom dimensions, stanchion layout and wheelchair maneuverability layout along with a calculation of the free floor space, total passenger

capacity and resulting GVW. The Contractor may provide alternative seating configurations that maximize the passenger capacity, seated and standees, of the bus.

TS 76.2 Rearward Facing Seats

Rearward facing seats not allowed.

TS 76.3 Turntable Seating – not used

TS 76.4 Padded Inserts/Cushioned Seats

Non-Padded Inserts

The passenger seats shall be equipped with non-padded inserts throughout the bus.

TS 76.5 Drain Hole in Seats

Requirement for Drain Hole Provision in Seat Inserts

Provision, such as a small grommeted hole, to allow drainage shall be incorporated into seat insert (drain through hole – 1/4 inch through hole, bottom seat only, one per seat).

TS 76.6 Hip-to-Knee Room

Hip-to-knee room measured from the center of the seating position, from the front of one seat back horizontally across the highest part of the seat to vertical surface immediately in front, shall be a minimum of 26 inches. At all seating positions in paired transverse seats immediately behind other seating positions, hip-to-knee room shall be no less than 27 inches

In order to maximize seating capacity without unduly affecting passenger comfort, minor variations in the required hip-to-knee room will be allowed in limited areas. All such areas shall be identified to the GVI for approval.

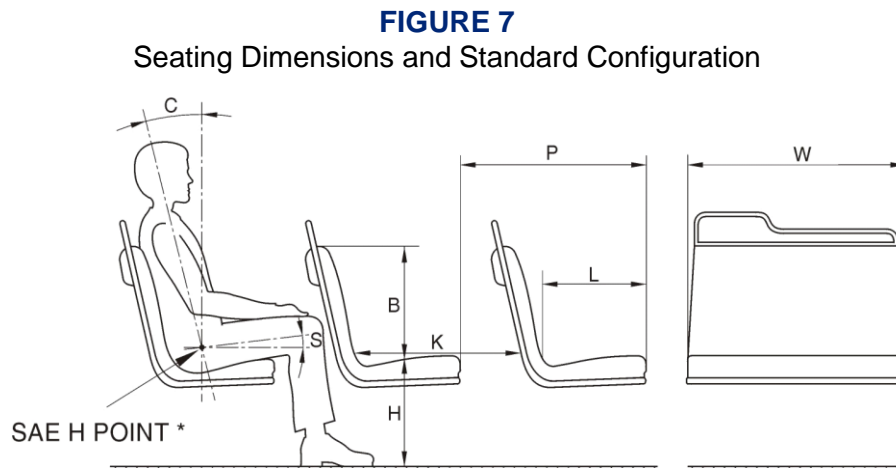
TS 76.7 Foot Room

Foot room, measured at the floor forward from a point vertically below the front of the seat cushion, shall be no less than 14 inches. Seats immediately behind the wheel housings and modesty panels may have foot room reduced.

TS 76.8 Aisles

The aisle between the seats shall be no less than 20 inches wide at seated passenger hip height. Seat backs shall be shaped to increase this dimension to no less than 24 inches at 32 inches above the floor (standing passenger hip height).

TS 76.9 Dimensions



Seat dimensions for the various seating arrangements shall have the dimensions as follows (refer to Figure 7):

- The width, W, of the two-passenger transverse seat shall be a minimum 35 inches
- The length, L, shall be 17 inches, ± 1 inch.
- The seat back height, B, shall be a minimum of 15 inches.
- The seat height, H, shall be 17 inches, ± 1 inch. For the rear lounge (or settee) and longitudinal seats, and seats located above raised areas for storage of under-floor components, a cushion height of up to 18 inches, ± 2 inches, will be allowed. This shall also be allowed for limited transverse seats, but only with the expressed approval of the GVI.
- Foot room = F as specified.
- The seat cushion slope, S, shall be between 5 and 11 degrees.
- The seat back slope, C, shall be between 8 and 17 degrees.
- Hip to knee room = K as specified.
- The pitch, P, is shown as reference only.

TS 76.10 Structure and Design

The passenger seat frame and its supporting structure shall be constructed and mounted so that space under the seat is maximized and is completely free of obstructions to facilitate cleaning.

Seats, structures and restraints around the securement area should not infringe into the mobility device envelope or maneuverability.

The transverse seat structure shall be fully cantilevered from the sidewall with sufficient strength for the intended service. The lowest part of the seat assembly that is within 12 inches of the aisle shall be at least 10 inches above the floor.

In locations at which cantilevered installation is precluded by design and/or structure, other seat mounting may be allowed.

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All transverse objects — including seat backs, modesty panels, and longitudinal seats — in front of forward-facing seats shall not impart a compressive load in excess of 1000 lbs onto the femur of passengers ranging in size from a 5th-percentile female to a 95th-percentile male during a 10g deceleration of the bus. This deceleration shall peak at 0.05 to 0.015 seconds from initiation. Permanent deformation of the seat resulting from two 95th-percentile males striking the seat back during this 10g deceleration shall not exceed 2 inches, measured at the aisle side of the seat frame at height H. The seat back should not deflect more than 14 inches, measured at the top of the seat back, in a controlled manner to minimize passenger injury. Structural failure of any part of the seat or sidewall shall not introduce a laceration hazard.

The seat assembly shall withstand static vertical forces of 500 lbs applied to the top of the seat cushion in each seating position with less than ¼-inch permanent deformation in the seat or its mountings. The seat assembly shall withstand static horizontal forces of 500 lbs evenly distributed along the top of the seat back with less than ¼-inch permanent deformation in the seat or its mountings. The seat backs at the aisle position and at the window position shall withstand repeated impacts of two 40-lb sandbags without visible deterioration. One sandbag shall strike the front 40,000 times and the other sandbag shall strike the rear 40,000 times. Each sandbag shall be suspended on a 36-inch pendulum and shall strike the seat back 10,000 times each from distances of 6, 8, 10 and 12 inches. Seats at both seating positions shall withstand 4000 vertical drops of a 40-lb sandbag without visible deterioration. The sandbag shall be dropped 1000 times each from heights of 6, 8, 10 and 12 inches. Seat cushions shall withstand 100,000 randomly positioned 3½-inch drops of a squirming, 150-lb, smooth-surfaced, buttocks-shaped striker with only minimal wear on the seat covering and no failures to seat structure or cushion suspension components.

The back of each transverse seat shall incorporate a handhold no less than ⅞ inch in diameter for standees and seat access/egress. The handhold shall not be a safety hazard during severe decelerations. The handhold shall extend above the seat back near the aisle so that standees shall have a convenient vertical assist, no less than 4 inches long that may be grasped with the full hand. This handhold shall not cause a standee using this assist to interfere with a seated 50th-percentile male passenger. The handhold shall also be usable by a 5th-percentile female, as well as by larger passengers, to assist with seat access/egress for either transverse seating position. The upper rear portion of the seat back and the seat back handhold immediately forward of transverse seats shall be padded and/or constructed of energy absorbing materials. During a 10g deceleration of the bus, the HIC number (as defined by SAE Standard J211a) shall not exceed 400 for passengers ranging in size from a 5th percentile female through a 95th percentile male.

The seat back handhold may be deleted from seats that do not have another transverse seat directly behind and where a vertical assist is provided.

Longitudinal seats shall be the same general design as transverse seats but without seat back handholds. Longitudinal seats may be mounted on the wheelhouses. Armrests shall be included on the ends of each set of longitudinal seats except on the forward end of a seat set that is immediately to the rear of a transverse seat, the driver's barrier, or a modesty panel, when these fixtures perform the function of restraining passengers from sliding forward off the seat. Armrests are not required on longitudinal seats located in the wheelchair parking area that fold up when the armrest on the adjacent fixed longitudinal seat is within 3½ inches of the end of the seat cushion. Armrests shall be located from 7 to 9 inches above the seat cushion surface. The area between the armrest and the seat cushion shall be closed by a barrier or panel. The top and sides of the armrests shall have a minimum width of 1 inch and shall be free from sharp protrusions that form a safety hazard.

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Seat back handhold and armrests shall withstand static horizontal and vertical forces of 250 lbs applied anywhere along their length with less than ¼-inch permanent deformation. Seat back handhold and armrests shall withstand 25,000 impacts in each direction of a horizontal force of 125 lbs with less than ¼-inch permanent deformation and without visible deterioration.

At the GVI' request, a test report shall be provided by the Contractor that fully documents compliance with all the requirements defined above upon request. The test report shall contain a record of all testing activities, test diagrams, testing equipment, as well as test data related to loads, deflections and permanent deformation of the seat assembly. The report shall include a statement of compliance with the requirements of this section of the Technical Specifications.

TS 76.11 Construction and Materials

Selected materials shall minimize damage from vandalism and shall reduce cleaning time. The seats shall be attached to the frame with tamper-resistant fasteners. Coloring shall be consistent throughout the seat material, with no visually exposed portion painted. Any exposed metal touching the sides or the floor of the bus shall be stainless steel. The seat, pads and cushions shall be contoured for individuality, lateral support and maximum comfort and shall fit the framework to reduce exposed edges.

The minimum radius of any part of the seat back, handhold or modesty panel in the head or chest impact zone shall be a nominal ¼ inch. The seat back and seat back handhold immediately forward of transverse seats shall be constructed of energy-absorbing materials to provide passenger protection and, in a severe crash, allow the passenger to deform the seating materials in the impact areas. Complete seat assemblies shall be interchangeable to the extent practicable.

The seatback thickness shall not exceed ½ inch in the knee room area. Seat covering materials shall be selected on the basis of durability, ease of maintenance, and pleasing texture and appearance. The seat shall be dark gray in color throughout the complete seat.

TS 77. Passenger Assists

Passenger assists in the form of full grip, vertical stanchions or handholds shall be provided for the safety of standees and for ingress/egress. Passenger assists shall be convenient in location, shape, and size for both the 95th-percentile male and the 5th-percentile female standee. Starting from the entrance door and moving anywhere in the bus and out the exit door, a vertical assist shall be provided either as the vertical portion of seat back assist or as a separate item so that a 5th-percentile female passenger may easily move from one assist to another using one hand and the other without losing support. All handholds and stanchions at front doorway, around farebox, and at interior steps for bi-level designs shall be powder-coated in a high-contrast yellow color. The forward-most vertical stanchions on either side of the aisle immediately behind the driver's area shall be:

Passenger assists shall be brushed stainless steel finish.

TS 77.1 Assists

Excluding those mounted on the seats and doors, the assists shall have a cross-sectional diameter between 1¼ and 1½ inches or shall provide an equivalent gripping surface with no corner radii less than ¼ inch. All passenger assists shall permit a full hand grip with no less than 1½ inches of knuckle clearance around

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the assist. Passenger assists shall be designed to minimize catching or snagging of clothes or personal items and shall be capable of passing the NHTSA Drawstring Test.

Any joints in the assist structure shall be underneath supporting brackets and securely clamped to prevent passengers from moving or twisting the assists. Seat handholds may be of the same construction and finish as the seat frame. Door mounted passenger assists shall be of anodized aluminum, stainless steel or powder-coated metal. Connecting tees and angles may be powder-coated metal castings. Assists shall withstand a force of 300 lbs applied over a 12-inches lineal dimension in any direction normal to the assist without permanent visible deformation. All passenger assist components, including brackets, clamps, screw heads and other fasteners used on the passenger assists shall be designed to eliminate pinching, snagging and cutting hazards and shall be free from burrs or rough edges.

A drawing of the stanchion locations shall be included with the seat layout and provided by proposers for GVI review.

TS 77.2 Front Doorway

Front doors, or the entry area, shall be fitted with ADA-compliant assists. Assists shall be as far outward as practicable, but shall be located no farther inboard than 6 inches from the outside edge of the entrance step and shall be easily grasped by a 5th-percentile female boarding from street level. Door assists shall be functionally continuous with the horizontal front passenger assist and the vertical assist and the assists on the wheel housing or on the front modesty panel.

TS 77.3 Vestibule

The aisle side of the driver's barrier, the wheel housings, and when applicable the modesty panels shall be fitted with vertical passenger assists that are functionally continuous with the overhead assist and that extend to within 36 inches of the floor. These assists shall have sufficient clearance from the barrier to prevent inadvertent wedging of a passenger's arm.

A horizontal passenger assist shall be located across the front of the bus and shall prevent passengers from sustaining injuries on the fare collection device or windshield in the event of a sudden deceleration. Without restricting the vestibule space, the assist shall provide support for a boarding passenger from the front door through the fare collection procedure. The assist shall be no less than 36 inches above the floor. The assists at the front of the bus shall be arranged to permit a 5th-percentile female passenger to easily reach from the door assist, to the front assist, to vertical assists on the driver's barrier, wheel housings or front modesty panel.

TS 77.4 Rear Doorway(s)

Vertical assists that are functionally continuous with the overhead assist shall be provided at the aisle side of the transverse seat immediately forward of the rear door and on the aisle side of the rear door modesty panel(s). Passenger assists shall be provided on modesty panels that are functionally continuous with the rear door assists. Rear doors, or the exit area, shall be fitted with assists having a cross-sectional diameter between 1¼ and 1½ inches or providing an equivalent gripping surface with no corner radii less than ¼ inch, and shall provide at least 1½ inches of knuckle clearance between the assists and their mounting. The assists shall be designed to permit a 5th-percentile female to easily move from one assist to another during the entire exiting process. The assists shall be located no farther inboard than 6 inches from the outside edge of the rear doorway step.

TS 77.5 Overhead

Except forward of the standee line and at the rear door, a continuous, full grip, overhead assist shall be provided. This assist shall be located over the center of the aisle seating position of the transverse seats. The assist shall be no less than 70 inches above the floor.

No requirements for overhead grab straps/extensions.

Overhead assists shall simultaneously support 150 lbs on any 12-inch length. No more than 5 percent of the full grip feature shall be lost due to assist supports.

TS 77.6 Longitudinal Seat Assists

Longitudinal seats shall have vertical assists located between every other designated seating position, except for seats that fold/flip up to accommodate wheelchair securement. Assists shall extend from near the leading edge of the seat and shall be functionally continuous with the overhead assist. Assists shall be staggered across the aisle from each other where practicable and shall be no more than 52 inches apart or functionally continuous for a 5th percentile female passenger.

TS 77.7 Wheel Housing Barriers/Assists

Unless passenger seating is provided on top of wheel housing, passenger assists shall be mounted around the exposed sides of the wheel housings (and propulsion compartments if applicable), which shall also be designed to prevent passengers from sitting on wheel housings. Such passenger assists shall also effectively retain items, such as bags and luggage, placed on top of wheel housing.

TS 78. Passenger Doors

Doorways will be provided in the locations and styles as follows. Passenger doors and doorways shall comply with ADA requirements.

TABLE 6
Door Locations and Styles

Front Door				
Location	Slide Glide	Double (Two-Piece Pantograph)	Single (One-Piece Pantograph)	Outside Sliding Plug
Forward of the front wheels and under direct observation of the driver.	Yes			

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TABLE 6
Door Locations and Styles

Rear Doors						
Location	Slide Guide	Outward Opening Swing With Manual Emergency Reset	Outward Opening Swing With Auto Emergency Reset	Double (Two-Piece Pantograph)	Single (One-Piece Pantograph)	Outside Sliding Plug
Alternative 1: Curbside doorway centerline located rearward of the point midway between the front door centerline and the rearmost seat back.	Yes or	Yes				

If air-powered, the door system shall operate per specification at air pressures between 90 and 130 psi.

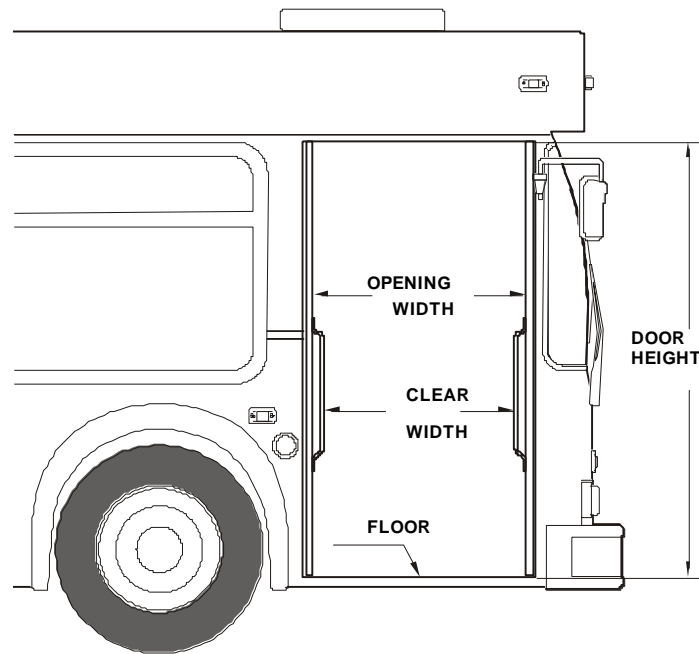
Materials and Construction

Structure of the doors, their attachments, inside and outside trim panels and any mechanism exposed to the elements shall be corrosion-resistant. Door panel construction shall be of corrosion-resistant metal or reinforced non-metallic composite materials. When fully opened, the doors shall provide a firm support and shall not be damaged if used as an assist by passengers during ingress or egress. Door edges shall be sealed to prevent infiltration of exterior moisture, noise, dirt and air elements from entering the passenger compartment, to the maximum extent possible based on door types.

The closing edge of each door panel shall have no less than 2 inches of soft weather stripping. The doors, when closed, shall be effectively sealed, and the hard surfaces of the doors shall be at least 4 inches apart. The combined weather seal and window glazing elements of the front door shall not exceed 10 degrees of binocular obstruction of the driver's view through the closed door.

TS 78.3 Dimensions

FIGURE 8
Transit Bus Minimum Door Opening



When open, the doors shall leave an opening no less than 75.3 inches in height.

31¾-inch Minimum Doorway Clear Width

Front door clear width shall be a minimum of 31¾ inches with the doors fully opened.

Rear door opening clear width shall be a minimum of 31¾ inches with door fully opened.

For an outward opening (swing) rear door, the maximum outboard excursion of 13 inches may be exceeded.

TS 78.2 Door Glazing

The upper section of both front and rear doors shall be glazed for no less than 45 percent of the respective door opening area of each section. The lower section of the front door shall be glazed for no less than 25 percent of the door opening area of the section.

Door glazing shall be easily replaceable.

Zip type glazing rubber.

The front door panel glazing material shall have a nominal ¼ inch thick laminated safety glass conforming with the requirements of ANSI Z26.1 Test Grouping 2 and the Recommended Practices defined in SAE J673.

Glazing material in the rear doorway door panels shall be the same material, thickness and color as the side windows.

TS 78.3 Door Projection

Exterior

The exterior projection of the front doors beyond the side of the bus shall be minimized and shall not block the line of sight of the rear exit door via the curb side mirror when the doors are fully open. The exterior projection of both doors shall be minimized and shall not exceed 13 inches during the opening or closing cycles or when doors are fully opened

Interior

Projection inside the bus shall not cause an obstruction of the rear door mirror or cause a hazard for standees.

TS 78.4 Door Height Above Pavement

It shall be possible to open and close either passenger door when the bus loaded to GVWR is not knelt and parked with the tires touching an 8-inch-high curb on a street sloping toward the curb so that the street side wheels are 5 inches higher than the right side wheels.

TS 78.5 Closing Force

Closing door edge speed shall not exceed 12 inches per second, and opening door speed shall not exceed 19 inches per second. Power doors shall not slam closed under any circumstance, even if the door is obstructed during the closing cycle. If a door is obstructed during the closing cycle, the pressure exerted on the obstruction shall not increase once initial contact has been made.

Power-close rear doors shall be equipped with an obstruction sensing system such that if an obstruction is within the path of the closing doors, the doors will stop and/or reverse direction prior to imparting a 10-lb force on 1 square inch of that obstruction. If a contactless obstruction sensing system is employed, it shall be capable of discriminating between the normal doorway environment and passengers or other obstructions within the doorway, and of altering the zones of detection based upon the operating state of the door system.

Doors closed by a return spring or counterweight-type device shall be equipped with an obstruction-sensing device that, at a minimum, alerts the driver if an obstruction is detected between the closing doors. Doors closed by a return spring or counterweight type device, when unlocked, shall be capable of being pushed to the point where the door starts to open with a force not to exceed 25 lbs applied to the center edge of the forward door panel.

Whether or not the obstruction sensing system is present or functional, it shall be possible to withdraw a 1½ inches diameter cylinder from between the center edges of a closed and locked door with an outward force not greater than 35 lbs.

TS 78.6 Actuators

Doors shall open or close completely in not more than 3.5 seconds from the time of control actuation and shall be subject to the closing force requirements.

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Door actuators shall be adjustable so that the door opening and closing speeds can be independently adjustable to satisfy the above requirements. Actuators and the complex door mechanism shall be concealed from passengers but shall be easily accessible for servicing. The door actuators shall be rebuildable. If powered by compressed air, exhaust from the door system shall be routed below the floor of the bus to prevent accumulation of any oil that may be present in the air system and to muffle sound.

Door actuators and associated linkages shall maximize door holding forces in the fully open and fully closed positions to provide firm, non-rattling, non-fluttering door panels while minimizing the force exerted by the doors on an obstruction midway between the fully open and closed positions.

The rear doors shall be passenger-controlled. The vehicle operator shall unlock and enable the opening mechanism, which shall be annunciated by illumination of a green light near the door. After enabling and unlocking, the doors shall be opened by either the passenger manually pushing the door open, or by a powered mechanism actuated by passenger activation of a touch bar or touch switch, or by passenger activation of a contactless sensing system.

An alarm shall sound whenever the rear door is opened or attempted to be opened when rear doors are not powered. Doors shall automatically close when touch-bars are released

Doors that employ a “swing” or pantograph geometry and/or are closed by a return spring or counterweight-type device shall be equipped with a positive mechanical holding device that automatically engages and prevents the actuation mechanism from being back-driven from the fully closed position. The holding device shall be overcome only when the driver’s door control is moved to an “Exit Door Enable” position and the vehicle is moving at a speed of less than 2 mph, or in the event of actuation of the emergency door release.

Locked doors shall require a force of more than 300 lbs to open manually. When the locked doors are manually forced to open, damage shall be limited to the bending of minor door linkage with no resulting damage to the doors, actuators or complex mechanism.

TS 78.7 Rear Door Interlocks

See TS 36.1, Passenger Door Interlocks.

TS 78.8 Emergency Operation

In the event of an emergency, it shall be possible to manually open doors designated as emergency exits from inside the bus using a force of no more than 25 lbs after actuating an unlocking device. The unlocking device shall be clearly marked as an emergency-only device and shall require two distinct actions to actuate. The respective door emergency unlocking device shall be accessible from the doorway area. The unlocking device shall be easily reset by the operator without special tools or opening the door mechanism enclosure. Doors that are required to be classified as “Emergency Exits” shall meet the requirements of FMVSS 217.

When the rear door emergency device is actuated, the door interlock throttle system shall return the engine to idle and the door interlock brake system shall apply to stop the bus. When the front door emergency device is actuated only the door interlock throttle system shall be actuated.

TS 78.9 Door Control

The door control shall be located in the operator's area within the hand reach envelope described in SAE Recommended Practice J287, "Driver Hand Control Reach." The driver's door control shall provide tactile feedback to indicate commanded door position and resist inadvertent door actuation.

Door control shall be located on the street side.

The front door shall remain in commanded state position even if power is removed or lost.

TS 78.10 Door Controller

Five-Position Driver's Door Controller

The control device shall be protected from moisture. Mounting and location of the door control device handle shall be designed so that it is within comfortable, easy arm's reach of the seated driver. The door control device handle shall be free from interference by other equipment and have adequate clearance so as not to create a pinching hazard.

Position of the door control handle shall result in the following operation of the front and rear doors:

- **Center position:** Front door closed, rear door(s) closed or set to lock.
- **First position forward:** Front door open, rear door(s) closed or set to lock.
- **Second position forward:** Front door open, rear door(s) open or set to open.
- **First position back:** Front door closed, rear door(s) open or set to open.
- **Second position back:** Front door open, rear door(s) open or set to open.

TS 78.11 Door Open/Close

Operator-Controlled Front and Passenger-Controlled Rear Doors

Operation of, and power to, the front passenger doors shall be completely controlled by the operator. Power to rear doors shall be controlled by operator. After enabling, the rear doors shall be opened by the passenger (see TS 78.6 Actuators).

A control or valve in the operator's compartment shall shut off the power to, and/or dump the power from, the front door mechanism to permit manual operation of the front door with the bus shut down. A master door switch, which is not within reach of the seated operator, when set in the "off" position shall close the rear/center doors, deactivate the door control system, release the interlocks, and permit only manual operation of the rear/center doors.

TS 79. Accessibility Provisions

Space and body structural provisions shall be provided at the front or rear door of the bus to accommodate a wheelchair loading system.

TS 79.1 Loading Systems

There are two options:

- high-floor lift in rear door
- low-floor - ramp in front door

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The loading system shall be manufactured by Ricon or Braun.

TS 79.2 Lift

The wheelchair lift control system must be capable of receiving multiplex command from vehicle interlocks.

An automatically controlled, power-operated wheelchair lift system compliant to requirements defined in 49 CFR 571.403 (FMVSS 403) shall provide ingress and egress quickly, safely and comfortably, both in forward and rearward directions, for a passenger in a wheelchair from a level street or curb.

The wheelchair lift shall be mounted in the rear door location.

Folding Lifts

When the system is not in use, the passageway shall appear normal. In the stored position of the ramp, no tripping hazards shall be present, and any resulting gaps shall be minimized. The controls shall be simple to operate with no complex phasing operations required, and the loading system operation shall be under the surveillance and complete control of the driver. If the loading system and controls are at the rear doors, a keyed switch shall be provided in the driver's area to disable the loading system. The bus shall be prevented from moving during the loading or unloading cycle by a throttle and brake interlock system. The loading system shall be inhibited from stowing/deploying when a passenger is on the ramp/platform. A passenger departing or boarding via the ramp shall be able to easily obtain support by grasping the passenger assist located on the doors or other assists provided for this purpose. The platform shall be designed to protect the ramp from damage and persons on the sidewalk from injury during the extension/retraction or lowering/raising phases of operation.

The loading platform shall be covered with a replaceable or renewable nonskid material and shall be fitted with devices to prevent the wheelchair from rolling off the sides during loading or unloading.

Deployment or storage of the ramp shall require no more than 15 seconds. The device shall function without failure or adjustment for 500 cycles or 5000 miles in all-weather conditions on the design operating profile when activated once during the idle phase. A manual override system shall permit unloading a wheelchair and storing the device in the event of a primary power failure. The manual operation of the ramp shall not require more than 35 lbs of force.

TS 79.3 Loading System for 30- to 60-ft Low-Floor Bus

An automatically-controlled, power-operated ramp system compliant to requirements defined in 49 CFR Part 38, Subpart B, §38.23c shall provide ingress and egress quickly, safely and comfortably, both in forward and rearward directions, for a passenger in a wheelchair from a level street or curb.

Front Door Location of Loading System, Flip-Out Design Ramp with 6:1 Slope

The wheelchair loading system shall be located at the front door, with the ramp being of a simple hinged, flip-out type design being capable of deploying to the ground at a maximum 6:1 slope.

The loading platform shall be covered with a replaceable or renewable nonskid material and shall be fitted with devices to prevent the wheelchair from rolling off the sides during loading or unloading.

Deployment or storage of the ramp shall require no more than 15 seconds. The device shall function without failure or adjustment for 500 cycles or 5000 miles in all-weather conditions on the design operating profile when activated once during the idle phase. A manual override system shall permit unloading a wheelchair and storing the device in the event of a primary power failure. The manual operation of the ramp shall not require more than 35 lbs of force.

TS 79.4 Loading System for Level Boarding on a 45- to 60-ft Low-Floor BRT – not used

TS 79.5 Wheelchair Accommodations

NOTE: The GVI will approve acceptable securement system.

Two Forward-Facing Wheelchair Securement Locations

Two forward-facing locations, as close to the wheelchair loading system as practical, shall provide parking space and securement system compliant with ADA requirements for a passenger in a wheelchair.

Additional equipment, including passenger restraint seat belts, shoulder harnesses and wheelchair securement devices shall be provided for each wheelchair passenger. All belt assemblies must stow up and out of the way when not in use.

TS 79.6 Interior Circulation

Maneuvering room inside the bus shall accommodate easy travel for a passenger in a wheelchair from the loading device and from the designated securement area. It shall be designed so that no portion of the wheelchair protrudes into the aisle of the bus when parked in the designated parking space(s). When the positions are fully utilized, an aisle space of no less than 20 inches shall be maintained. As a guide, no width dimension should be less than 34 inches. Areas requiring 90-degree turns of wheelchairs should have a clearance arc dimension no less than 45 inches, and in the parking area where 180-degree turns are expected, space should be clear in a full 60-inch-diameter circle. A vertical clearance of 12 inches above the floor surface should be provided on the outside of turning areas for wheelchair footrest.

SIGNAGE AND COMMUNICATION

TS 80. Destination Signs

A destination sign system shall be furnished on the front, on the curb side (left side) near the front door, and on the rear of the bus. The GVI will provide a list of signs to be displayed.

Curb Side Route Sign

The sign located near the front door shall not block the driver's critical horizontal line of sight. Display areas of destination signs shall be clearly visible in direct sunlight and/or at night. Parts shall be commercially available.

All signs shall be controlled via a single human-machine interface (HMI). In the absence of a single mobile data terminal (MDT), the HMI shall be conveniently located for the bus driver within reach of the seated driver.

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Baseline signs will be of electronic design, with the following requirements.

1. The bus “Master Run” switch shall control power to the external passenger information signs, and shall be operable in all switch positions except "Off". After the “Master Run” switch is placed in the “Off” position, all signs shall blank within 30 seconds, before powering down.
2. An emergency message may be specified by the GVI, which will only be displayed on exterior signs, initiated by a foot switch. Via the sign programming software, each sign shall be separately configurable, with an option for all signs to be consistently configured from a single alphanumeric message. Signs shall have alternating message capability with selectable transition effects.
3. The front sign shall have pixel elements of at least 16 rows by 105 columns. The side sign shall have pixel elements of at least 7 rows by 80 columns. The rear sign shall have pixel elements of at least 7 rows by 23 columns.
4. Light-emitting diodes (LEDs) and liquid crystal displays (LCDs) shall have a rated life of at least 100,000 hours.

The destination sign compartments shall meet the following minimum requirements:

- Compartments shall be designed to prevent condensation and entry of moisture and dirt.
- Compartments shall be designed to prevent fogging of both compartment window and glazing on unit itself.
- Access shall be provided to allow cleaning of inside compartment window and unit glazing.
- Front window shall have an exterior display area of no less than 8.5 inches high by 56 inches wide.

An illuminated run number sign box with three characters, 4 ½ inches high, shall be mounted on the dash panel to the left of center of the bus. The sign shall be mounted with a built-in appearance to eliminate glare and reflections in the windshield and shall minimize obstruction of the operator's view. Manual adjustment of the block number sign entry shall be provided from inside the bus with provision for reading the sign during the adjustment operation. Illumination of the sign shall be concurrent with the marker lights.

TS 81. Passenger Information and Advertising

TS 81.1 Interior Displays

Provisions shall be made on the rear of the driver’s barrier or equipment box located on the wheel well (low-floor bus) for a frame to retain information such as routes and schedules.

Advertising media 11 inches high and 0.09 inch thick shall be retained near the juncture of the bus ceiling and sidewall. The retainers may be concave and shall support the media without adhesives. The media shall be illuminated by the interior light system.

TS 81.2 Exterior Displays

Not required.

TS 82. Passenger Stop Request/Exit Signal

Pull Cord Passenger Signal

A passenger “stop requested” signal system that complies with applicable ADA requirements defined in 49 CFR, Part 38.37 shall be provided. The system shall consist of a heavy-duty pull cable, chime and interior sign message. The pull cable shall be located the full length of the bus on the sidewalls at the level where the transom is located. If no transom window is required, the height of the pull cable shall approximate this transom level and shall be no greater than 63 inches as measured from the floor surface. It shall be easily accessible to all passengers, seated or standing. Pull cable(s) shall activate one or more solid state or magnetic proximity switches. At each wheelchair passenger position and at priority seating positions, additional provisions shall be included to allow a passenger in a mobility aid to easily activate the “stop requested” signal.

An auxiliary passenger “stop requested” signal shall be installed at the rear door to provide passengers standing in the rear door/exit area convenient means of activating the signal system. The signal shall be a heavy-duty push button type located in the rear door vicinity. Button shall be clearly identified as “passenger signal.”

The operator shall be able to deactivate the signal system from the operator's area.

A single “stop requested” chime shall sound when the system is first activated. A double chime shall sound anytime the system is activated from wheelchair passenger areas.

Exit signals located in the wheelchair passenger area shall be no higher than 4 feet above the floor. Instructions shall be provided to clearly indicate function and operation of these signals.

A "Stop Requested" message in red letters shall be illuminated when the passenger "Stop Requested" signal system is activated. The "Stop Requested" message shall remain visible until one or both passenger doors are opened. The message shall be visible to the seated operator and seated passengers. The operator shall be able to deactivate the signal system from the operator's area. A green light shall be mounted above the rear door, approximately on center of the rear door actuator compartment access panel, to indicate when the rear doors have been unlocked.

TS 83. Communications

TS 83.1 Camera Surveillance System

The Contractor shall provide and install a closed circuit TV (CCTV) camera and monitor to assist the driver in backing up the bus. A backup camera shall be mounted on the exterior rear of the bus. The monitor shall be mounted with a built-in appearance to eliminate glare and reflections in the windshield and shall minimize obstruction of the operator's view.

The Contractor shall provide separate pricing for the following options:

- a. Wiring and mounting locations for additional interior camera(s) and monitor to be installed later; or
- b. The installation of additional camera(s) and monitor; or
- c. A CCTV recording system.

The number of additional interior cameras and the location of equipment shall be proposed by the Contractor.

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The optional interior system shall include a sufficient number of cameras to allow continuous monitoring by the driver. The cameras shall be mounted to provide a clear view of the entire passenger compartment, and be protected to prevent tampering and vandalism.

a. Wiring And Mounting Locations For A CCTV System

Provide all wiring and mounting locations for a multi-camera surveillance system for the later provision of and installation of a monitor, interior cameras and recorder.

b. A CCTV Monitoring System

Provide all wiring and mounting locations for a multi-camera surveillance system including the installation of a monitor and interior cameras.

c. A CCTV Recording System

Provide all wiring and mounting locations for a multi-camera surveillance system including the installation of a monitor, interior cameras and a recording device.

TS 83.2 Public Address System

A public address system shall be provided that complies with the ADA requirements of 49 CFR, Part 38.35 and enables the operator to address passengers either inside or outside the bus. An operator-controlled switch shall select inside or outside announcements. A separate volume control shall be provided for the outside system if volume adjustment would otherwise be necessary when switching from inside to outside. The system shall be muted when not in use. A provision shall be provided to secure the microphone in a stored position when not in use. An input jack and mounting clip shall be provided in the operator's area for a hand held microphone. The hand held microphone shall be provided.

The microphone shall be vandal resistant, mounted on a heavy-duty, flexible gooseneck, which is secured with tamper-proof fasteners and will allow the operator to comfortably speak into it without using his/her hands.

TS 83.2.1 Speakers

Inside speakers shall broadcast, in a clear tone, announcements that are clearly perceived from all seat positions at approximately the same volume level. A speaker shall be provided so announcements can be clearly heard by passengers standing outside the bus near the front door.

Interior loudspeakers shall be provided, semi-flush mounted, on alternate sides of the bus passenger compartment, installed with proper phasing. Total impedance seen at the input connecting end shall be 8 Ohms. Mounting shall be accomplished with riv-nuts and machine screws.

TS 83.3 Automatic Passenger Counter (APC) – not used

TS 83.4 Radio Handset/Headset and Control System

The GVI will supply the radio equipment, except for the headsets. The Contractor shall configure the bus, supply four (4) headsets per bus, and install the radio equipment in the Virgin Islands. The GVI will provide the radio system make and model prior to contract award.

The radio includes an operator speaker, handset, headset and jack, and shall be programmable with multiple channels. A location convenient to the operator shall be provided for the radio control head, speaker, handset and headset jack. The location shall conform to SAE Recommended Practice J287 "Driver Hand Control Reach." An interior location shall be provided for the radio box.

Provisions for attaching an antenna to the roof and routing an antenna lead to the radio compartment shall be provided. Antenna mounting shall conform to the electromagnetic suppression requirements of SAE J551. A roof mounted radio antenna requires a ground plane to prevent electronic noise being generated inside the vehicle. A metal roof can serve as a sufficient ground plane, however a fiberglass roof requires either a metallic surface, or an antenna with a virtual ground plane. To test and repair antenna connections, quick access shall be provided inside the vehicle at the point where the antenna is mounted to the roof and where the antenna cable attaches to the antenna.

TS 83.4.1 Drivers Speaker

Each bus shall have a recessed speaker in the ceiling panel above the driver. This speaker shall be the same component used for the speakers in the passenger compartment. It shall have 8 Ohms of impedance.

TS 83.4.2 Handset

In addition to a handset, the Contractor will install a headset jack for driver use.

TS 83.4.3 Driver Display Unit (DDU)

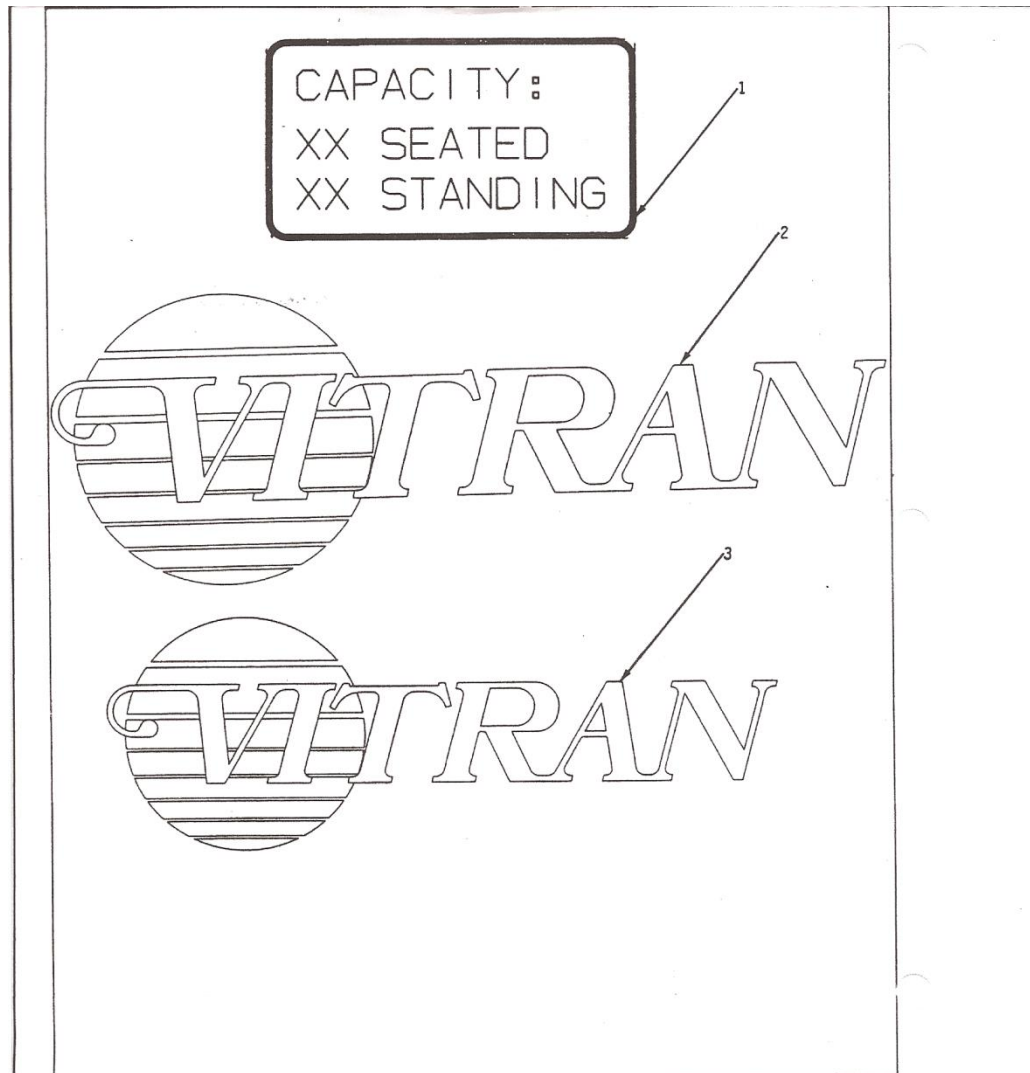
Contractor shall install a driver display unit as close to the driver's instrument panel as possible.

TS 83.4.4 Emergency Alarm

Contractor shall install an emergency alarm that is accessible to the driver but hidden from view.



Vitran Decals



ATTACHMENT 2
DESTINATION SIGN READINGS

<p><i>DESTINATION SIGNS - ST. CROIX</i> <i>ST. THOMAS and ST. JOHN</i></p>
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1 F'STED Via QUEEN MARY H'WAY

1A C'STED Via QUEEN MARY H'WAY

2 WM DELIGHT / LA REINE Via MON BIJOU

2A LA REINE / WM DELIGHT Via MON BIJOU

3 LA REINE / TIDE VILLAGE Via NORTH SIDE

3A TIDE VILLAGE / LA REINE Via NORTH SIDE

4 CATH. REST / LA REINE Via NORTH SIDE

4A LA REINE / CATH. REST Via NORTH SIDE

5 AIRPORT / LA REINE Via RACETRACK

5A LA REINE / AIRPORT Via RACETRACK

FREDRIKSTED EXPRESS

CHRISTIANSTED EXPRESS

S P E C I A L

E X P R E S S

S H U T T L E

SPECIAL / EAST END

SPECIAL / LA VALLEE

C H A R T E R

CRAMMERS PARK

PARK 'N' RIDE

OUT - OF - SERVICE

CITY / BUS DEPOT

1 CITY / SUB BASE / AIRPORT

1A CITY / KIRWAN TERRACE / UVI

2 BORDEAUX Via CROWN MOUNTAIN

2A SUG. ESTATE Via BUS DEPOT / VETERANS DRIVE

3 TUTU PARK MALL/HIDDEN VALLEY Via DONOE RD.

3A SUG. ESTATE Via DONOE RD. / ESTATE THOMAS

4A RED HOOK/SMITH BAY Via FOUR WINDS PLAZA

4A1 SUG. ESTATE Via FRYDENHOJ / ESTATE THOMAS

4B RED HOOK/NADIR Via BROOKMAN RD.

4B1 SUG. ESTATE Via SMITH BAY / CHA. AMALIE / EST. THOMAS

5 THOMASVILLE/BOVONI Via BROOKMAN RD.

5A SUG. ESTATE Via / BROOKMAN RD. / EST. THOMAS

6 OLD TUTU/NEW TUTU Via FOUR WINDS PLAZA

6A SUG. ESTATE Via CHA. AMALIE / EST. THOMAS

7 LOVENLUND/MAHOGANY RUN Via MAND AHL RD.

7A TUTU PARK MALL Via WINTBERG / MAND AHL RD.

8 EST. PEARL Via ST. PETER MOUNTAIN ROAD

8A SUG. ESTATE Via S.P.M.R. / VETERANS DRIVE

9 THOMASVILLE Via FRENCHMANS BAY / BOLONGO

9A SUG. ESTATE Via BOLONGO / HAVENSIGHT

10 ANNA BERG Via NORTH SHORE RD.

11 CRUZ BAY Via CENTER LINE RD.

11A CORAL BAY Via CENTER LINE RD.

12 M.K. SMITH CLINIC Via GIFFT HILL

13 SALT POND Via TRIANGLE

ATTACHMENT 3

MINIMUM LIST OF TOOLS AND EQUIPMENT

(TO BE SUBMITTED WITH PRICING PROPOSAL)

<u>Item</u>	<u>Price</u>
1. Towing adapter	
2. Jacking adapter	
3. Engine cradle stand	
4. Engine stand	
5. Transmission jack	
6. Transmission stand	
7. Engine tune up kit including belt tension gauge, seal installers/removers, injector timing gauge, valve lash gauges, etc.	
8. Wheel alignment tools	
9. Handheld diagnostic reader w/ printers for engine	
10. Handheld diagnostic reader for transmission	
11. Handheld diagnostic reader for HVAC system	
12. Handheld diagnostic reader for trouble-shooting components on the multiplex system. (all cables are to be included)	
13. Programmable portable PC with all necessary Software to reprogram components on the multiplex system	
14. Handheld radio and charger for supervision as described in Section "Radio"	
END OF LIST	

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REFERENCES

SAE #	Title	Date Published
J10	Methods of Test for Paints - Part J10: Determination of Deposition Efficiency of Coating Powders	Sep 15, 1998
J211	Instrumentation for Impact Test—Part 2: Photographic Instrumentation	May 1, 2001
J287	Driver Hand Control Reach	Feb 1, 2007
J366	Exterior Sound Level for Heavy Trucks and Buses	Feb 1, 1987
J382	Windshield Defrosting Systems Performance Requirements - Trucks, Buses, and Multipurpose Vehicles.	Jan 1, 1994
J534	Lubrication Fittings	May 1, 2008
J537	Storage Batteries	Sep 1, 2000
J541	Voltage Drop for Starting Motor Circuits	Oct 1, 1996
J587	License Plate Illumination Devices (Rear Registration Plate Illumination Devices)	Sep 1, 2003
J593	Backup Lamps (Reversing Lamps)	Sep 1, 2005
J673	Automotive Safety Glasses	Oct 1, 2005
J680	Location and Operation of Instruments and Controls in Motor Truck Cabs, Recommended Practice	Sep 1, 1988
J686	Motor Vehicle License Plates	Oct 1, 1999
J689	Curbstone Clearance, Approach, Departure, and Ramp Breakover Angles—Passenger Car and Light Truck	Aug 1, 2009
J833	Human Physical Dimensions	May 1, 2003
J844	Nonmetallic Air Brake System Tubing	Nov 1, 2004
J941	Motor Vehicle Drivers' Eye Locations	Mar 1, 2010
J994	Alarm—Backup—Electric Laboratory Performance Testing	Mar 1, 2009
J1050	Describing and Measuring the Driver's Field of View	Jan 1, 2003
J1113	Electromagnetic Compatibility Component Test Procedure Part 42, Conducted Transient Emissions	Oct 1, 2006
J1127	Low Voltage Battery Cable	Mar 1, 2010
J1128	Low Voltage Primary Cable	Dec 1, 2005
J1149	Metallic Air Brake System Tubing and Pipe	Aug 1, 2007
J1292	Automobile and Motor Coach Wiring	Jan 1, 2008
J1455	Recommended Environmental Practices for Electronic Equipment Design in Heavy-Duty Vehicle Applications	Jun 1, 2006
J1587	Joint SAE/TMC Electronic Data Interchange between Microcomputer Systems in Heavy-Duty Vehicle Applications, Recommended Practice	Jan 1, 1996
J1708	Serial Data Communications Between Microcomputer Systems in Heavy-Duty Vehicle Applications	Oct 1, 2008
J1986	Balance Weight and Rim Flange Design Specifications, Test Procedures, and Performance Recommendations	Jan 1, 2006
J1939	Data Link Layer	Dec 1, 2006
J1995	Engine Power Test Code - Spark Ignition and Compression Ignition - Gross Power Rating, Standard;	Jun 1, 1990
J2402	Road Vehicles—Symbols for Controls, Indicators, and Tell-tales	Jan 1, 2010
J2711	Recommended Practice for Measuring Fuel Economy and Emissions of Hybrid-Electric and Conventional Heavy-Duty Vehicles	Sept 1, 2002

Abbreviation and Acronyms

A/C	air conditioning
ABS	anti-lock braking system
AC	alternating current
ACQ	alkaline copper quaternary
ADA	Americans with Disabilities Act
Ah	amp hour
ALR	auto-locking retractor
APA	The Engineered Wood Association, formerly the American Plywood Association
APC	automatic passenger counter
APTA	American Public Transportation Association
ASTM	ASTM International, formerly the American Society for Testing and Materials
ATC	automatic traction control
AVL	automatic vehicle location
AWG	American Wire Gauge
BAFO	best and final offer
BMS	Battery Management System
BRT	bus rapid transit
CARB	California Air Resources Board
CBD	central business district
CCS	climate control system
CCTV	closed-circuit television
cfm	cubic feet per minute
CGA	Compressed Gas Association
CNG	compressed natural gas
dB	decibel
DBE	disadvantaged business enterprise
DC	direct current
DDU	driver display unit
DEF	diesel exhaust fluid
DOT	Department of Transportation
DPF	diesel particulate filter
ECM	engine control module
ECS	emission control system
ELR	emergency locking retractor
ECU	electronic control unit
EMI	electromagnetic interference
EPA	Environmental Protection Agency
ESS	energy storage system
FEA	finite element analysis
FMEA	failure modes and effects analysis
FMCSA	Federal Motor Carrier Safety Administration
FMCSR	Federal Motor Carrier Safety Regulations
FMVSS	Federal Motor Vehicle Safety Standards
FTA	Federal Transit Administration
GAWR	gross axle weight rating
GPS	global positioning system
GVW	gross vehicle weight

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GVWR	gross vehicle weight rating
H-point	hip-point
HDS	hybrid drive system
HDU	high density urban
HMI	human-machine interface
HSC	hybrid system controller
HV	high voltage
HVAC	heating, ventilation and air conditioning
I/O	input/output
IEEE	Institute of Electrical and Electronics Engineers
ISO	International Standards Organization
LCD	liquid crystal display
LED	light-emitting diode
LEL	LED emergency light
LV	low voltage
mA	milliampere
MDT	mobile data terminal
MPa	mega-Pascal
NC	normally closed
NFPA	National Fire Protection Association
NGV	natural gas vehicle
NOx	nitrogen oxide
NO	normally open
NTP	notice to proceed
OEM	original equipment manufacturer
OSI	open systems interconnect
PA	public address
PMO	project management oversight
PPU	primary propulsion unit
PPU	prime power unit
PPV	price per vehicle
PRD	pressure relief device
psi	pounds per square inch
RF	radio frequency
RFI	radio frequency interference
RTC	real-time clock
SAE	SAE International, formerly the Society of Automotive Engineers
scf	standard cubic feet
SLW	seated load weight
SOC	state of charge
UL	Underwriters Laboratories
UNECE	United Nations Economic Commission for Europe
VDC	volts of direct current
Wh	watt-hours
VIN	vehicle information number

SECTION 7: WARRANTY REQUIREMENTS

BASIC PROVISIONS

WR 1.1 Warranty Requirements

WR 1.1.1 Contractor Warranty

Warranties in this document are in addition to any statutory remedies or warranties imposed on the Contractor. Consistent with this requirement, the Contractor warrants and guarantees to the GVI each complete bus and specific subsystems and components as follows. Performance requirements based on design criteria shall not be deemed a warranty item.

WR 1.1.2 Complete Bus

The complete bus, propulsion system, components, major subsystems and body and chassis structure are warranted to be free from Defects and Related Defects for two (2) years or 100,000 miles, whichever comes first, beginning on the date of revenue service but not longer than 15 days after acceptance under “Inspection, Testing and Acceptance.” The warranty is based on regular operation of the bus under the operating conditions prevailing in the GVI’ locale.

WR 1.1.3 Body and Chassis Structure

Body, body structure, structural elements of the suspension and engine cradle are warranted to be free from Defects and Related Defects for three years or 225,000 miles, whichever comes first.

Primary load-carrying members of the bus structure, including structural elements of the suspension, are warranted against corrosion failure and/or Fatigue Failure sufficient to cause a Class 1 or Class 2 Failure for a period of 12 years or 500,000 miles, whichever comes first.

WR 1.1.4 Propulsion System

Extended Warranty

Propulsion system components, specifically the engine, transmission and drive and non-drive axles shall be warranted to be free from Defects and Related Defects for five years or 300,000 miles, whichever comes first.

The propulsion system manufacturer’s standard warranty, delineating items excluded from the Extended Warranty, shall be submitted in accordance with the Request for Pre-Offer Change or Approved Equal or with the Form for Proposal Deviation.

Failure to submit exclusions shall mean there is no exclusions to the warranty.

WR 1.1.5 Emission Control System (ECS)

The Contractor warrants the emission control system for five years or 100,000 miles, whichever comes first. The ECS shall include, but is not limited to, the following components:

- complete exhaust system, including catalytic converter (if required)
- after-treatment device
- components identified as emission control devices

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WR 1.1.6 Subsystems

Other subsystems shall be warranted to be free from Defects and Related Defects for two years or 100,000 miles, whichever comes first. Other subsystems are listed below:

- **Brake system:** Foundation brake components, including advancing mechanisms, as supplied with the axles, excluding friction surfaces.
- **Destination signs:** All destination sign equipment for the front, side and rear signs, power modules and operator control.
- **Heating, ventilating:** Roof and/or rear main unit only, excluding floor heaters and front defroster.
- **AC unit and compressor:** Roof and/or rear main unit only, excluding floor heaters and front defroster.
- **Door systems:** Door operating actuators and linkages.
- **Air compressor**
- **Air dryer**
- **Wheelchair lift and ramp system:** Lift and/or ramp parts and mechanical only
- **Starter**
- **Alternator:** Alternator only. Does not include the drive system.
- **Charge air cooler:** Charge air cooler including core, tanks and including related surrounding framework and fittings.
- **Hydraulic systems:** Including radiator fan drive and power steering as applicable.
- **Engine cooling systems:** Radiator including core, tanks and related framework, including surge tank.
- **Transmission cooler**
- **Passenger seating excluding upholstery**
- **Fuel storage and delivery system**
- **Surveillance system including cameras and video recorders**

WR 1.1.7 Extended Warranties

The GVI requires the following additional subsystems to be warranted to be free from Defects and Related Defects for two years or 100,000 miles, whichever comes first.

- None

WR 1.1.8 Serial Numbers

Upon delivery of each bus, the Contractor shall provide a complete electronic list of serialized units installed on each bus to facilitate warranty tracking. The list shall include, but is not limited to:

- engine
- transmission
- alternator
- starter
- A/C compressor and condenser/evaporator unit
- drive axle
- power steering unit
- fuel cylinders (if applicable)
- air compressor
- wheelchair ramp (if applicable)

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The Contractor shall provide updated serial numbers resulting from warranty campaigns. The format of the list shall be approved by the GVI prior to delivery of the first production bus.

WR 1.1.9 Extension of Warranty

If, during the warranty period, repairs or modifications on any bus are made necessary by defective design, materials or workmanship but are not completed due to lack of material or inability to provide the proper repair for thirty (30) calendar days, the applicable warranty period shall be extended by the number of days equal to the delay period.

WR 1.2 Voiding of Warranty

The warranty shall not apply to the failure of any part or component of the bus that directly results from misuse, negligence, accident or repairs not conducted in accordance with the Contractor-provided maintenance manuals and with workmanship performed by adequately trained personnel in accordance with recognized standards of the industry. The warranty also shall be void if the GVI fails to conduct normal inspections and scheduled preventive maintenance procedures as recommended in the Contractor's maintenance manuals and if that omission caused the part or component failure. The GVI shall maintain documentation, auditable by the Contractor, verifying service activities in conformance with the Contractor's maintenance manuals.

WR 1.3 Exceptions and Additions to Warranty

The warranty shall not apply to the following items:

- scheduled maintenance items
- normal wear-out items
- items furnished by the GVI

Should the GVI require the use of a specific product and has rejected the Contractor's request for an alternate product, then the standard Supplier warranty for that product shall be the only warranty provided to the GVI. This product will not be eligible under "Fleet Defects," below.

WR 1.3.1 Pass-Through Warranty

Should the Contractor elect to not administer warranty claims on certain components and wish to transfer this responsibility to the Suppliers, or to others, the Contractor shall request this waiver.

Contractor shall state in writing that the GVI's warranty reimbursements will not be impacted. The Contractor also shall state in writing any exceptions and reimbursement including all costs incurred in transport of vehicles and/or components. At any time during the warranty period, the Contractor may request approval from the GVI to assign its warranty obligations to others, but only on a case-by-case basis approved in writing by the GVI. Otherwise, the Contractor shall be solely responsible for the administration of the warranty as specified. Warranty administration by others does not eliminate the warranty liability and responsibility of the Contractor.

WR 1.3.2 Superior Warranty

The Contractor shall pass on to the GVI any warranty offered by a component Supplier that is superior to that required herein. The Contractor shall provide a list to the GVI's noting the conditions and limitations of the

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Superior Warranty not later than the start of production. The Superior Warranty shall not be administered by the Contractor.

WR 1.4 Fleet Defects

WR 1.4.1 Occurrence and Remedy

A Fleet Defect is defined as cumulative failures of twenty-five (25) percent of the same components in the same or similar application in a minimum fleet size of ten (10) or more buses where such items are covered by warranty.

A Fleet Defect shall apply only to the base warranty period in sections entitled “Complete Bus,” “Propulsion System” and “Major Subsystems.” When a Fleet Defect is declared, the remaining warranty on that item/component stops. The warranty period does not restart until the Fleet Defect is corrected.

For the purpose of Fleet Defects, each option order shall be treated as a separate bus fleet. In addition, should there be a change in a major component within either the base order or an option order, the buses containing the new major component shall become a separate bus fleet for the purposes of Fleet Defects.

The Contractor shall correct a Fleet Defect under the warranty provisions defined in “Repair Procedures.” After correcting the Defect, the GVI and the Contractor shall mutually agree to and the Contractor shall promptly undertake and complete a work program reasonably designed to prevent the occurrence of the same Defect in all other buses and spare parts purchased under this Contract. Where the specific Defect can be solely attributed to particular identifiable part(s), the work program shall include redesign and/or replacement of only the defectively designed and/or manufactured part(s). In all other cases, the work program shall include inspection and/or correction of all of the buses in the fleet via a mutually agreed-to arrangement. The Contractor shall update, as necessary, technical support information (parts, service and operator’s manuals) due to changes resulting from warranty repairs. The GVI may immediately declare a Defect in design resulting in a safety hazard to be a Fleet Defect. The Contractor shall be responsible to furnish, install and replace all defective units.

WR 1.4.2 Exceptions to Fleet Defect Provisions

The Fleet Defect warranty provisions shall not apply to GVI-supplied items, such as radios, fare collection equipment, communication systems and tires. In addition, Fleet Defects shall not apply to interior and exterior finishes, hoses, fittings and fabric.

WR 2. Repair Procedures

WR 2.1 Repair Performance

The Contractor is responsible for all warranty-covered repair Work. To the extent practicable, the GVI will allow the Contractor or its designated representative to perform such Work. At its discretion, the GVI may perform such Work if it determines it needs to do so based on transit service or other requirements. Such Work shall be reimbursed by the Contractor.

WR 2.2 Repairs by the Contractor

If the GVI detects a Defect within the warranty periods defined in this section, it shall, within thirty (30) days, notify the Contractor’s designated representative. The Contractor or its designated representative shall, if requested, begin Work on warranty-covered repairs within five calendar days after receiving notification of a

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Defect from the GVI. The GVI shall make the bus available to complete repairs timely with the Contractor's repair schedule.

The Contractor shall provide at its own expense all spare parts, tools and space required to complete repairs. At the GVI' option, the Contractor may be required to remove the bus from the GVI' property while repairs are being affected. If the bus is removed from the GVI' property, repair procedures must be diligently pursued by the Contractor's representative.

The Contractor shall provide detailed information, including parts replaced and tasks performed, for all warranty repairs made. The Contractor shall not be required to provide labor hours or cost information.

WR 2.3 Repairs by the GVI

WR 2.3.1 Parts Used

If the GVI performs the warranty-covered repairs, it shall correct or repair the Defect and any Related Defects utilizing parts supplied by the Contractor specifically for this repair. At its discretion, the GVI may use Contractor-specified parts available from its own stock if deemed in its best interests.

WR 2.3.2 Contractor-Supplied Parts

The GVI may require that the Contractor supply parts for warranty-covered repairs being performed by the GVI. Those parts may be remanufactured but shall have the same form, fit and function, and warranty. The parts shall be shipped prepaid to the GVI from any source selected by the Contractor within fourteen (14) days of receipt of the request for said parts and shall not be subject to a GVI handling charge.

WR 2.3.3 Defective Component Return

The Contractor may request that parts covered by the warranty be returned to the manufacturing plant. The freight costs for this action shall be paid by the Contractor. Materials should be returned in accordance with the procedures outlined in "Warranty Processing Procedures."

WR 2.3.4 Failure Analysis

The Contractor shall, upon specific request of the GVI, provide a failure analysis of Fleet Defect or safety-related parts, or major components, removed from buses under the terms of the warranty that could affect fleet operation. Such reports shall be delivered within 60 days of the receipt of failed parts.

WR 2.3.5 Reimbursement for Labor and Other Related Costs

The GVI shall be reimbursed by the Contractor for labor. The amount shall be determined by the GVI for a qualified mechanic at a straight time wage rate of thirty-five dollars (\$35) per hour, which includes fringe benefits and overhead adjusted for the GVI' most recently published rate in effect at the time the Work is performed, plus the cost of towing the bus if such action was necessary and if the bus was in the normal service area. These wage and fringe benefit rates shall not exceed the rates in effect in the GVI' service garage at the time the Defect correction is made.

WR 2.3.6 Reimbursement for Parts

The GVI shall be reimbursed by the Contractor for defective parts and for parts that must be replaced to correct the Defect. The reimbursement shall be at the current price at the time of repair and shall include

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taxes where applicable, plus fifteen (15) percent handling costs. Handling costs shall not be paid if part is supplied by Contractor and shipped to the GVI.

WR 2.3.7 Reimbursement Requirements

The Contractor shall respond to the warranty claim with an accept/reject decision including necessary failure analysis no later than sixty (60) days after the GVI submits the claim and defective part(s), when requested. Reimbursement for all accepted claims shall occur no later than sixty (60) days from the date of acceptance of a valid claim. The GVI may dispute rejected claims or claims for which the Contractor did not reimburse the full amount. The parties agree to review disputed warranty claims during the following quarter to reach an equitable decision to permit the disputed claim to be resolved and closed. The parties also agree to review all claims at least once per quarter throughout the entire warranty period to ensure that open claims are being tracked and properly dispositioned.

WR 2.4 Warranty after Replacement/Repairs

If any component, unit or subsystem is repaired, rebuilt or replaced by the Contractor or by the GVI with the concurrence of the Contractor, the component, unit or subsystem shall have the unexpired warranty period of the original. Repairs shall not be warranted if the Contractor-provided or authorized parts are not used for the repair, unless the Contractor has failed to respond within five days, in accordance with “Repairs by the Contractor.”

If an item is declared to be a Fleet Defect, the warranty stops with the declaration of the Fleet Defect. Once the Fleet Defect is corrected, the item(s) shall have three (3) months or remaining time and/or miles of the original warranty, whichever is greater. This remaining warranty period shall begin on the repair/replacement date for corrected items on each bus if the repairs are completed by the Contractor or on the date the Contractor provides all parts to the GVI.

WR 2.4.1 Warranty Processing Procedures

The following list represents requirements by the Contractor to the GVI for processing warranty claims. One failure per bus per claim is allowed.

- bus number and VIN
- total vehicle life mileage at time of repair
- date of failure/repair
- acceptance/in-service date
- Contractor part number and description
- component serial number
- description of failure
- all costs associated with each failure/repair (invoices may be required for third-party costs):
 - towing
 - road calls
 - labor
 - materials
 - parts
 - handling
 - troubleshooting time

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WR 2.5 Forms

The GVI' forms will be accepted by the Contractor if all of the above information is included. Electronic submittal may be used if available between the Contractor and the GVI.

WR 2.6 Return of Parts

When returning defective parts to the Contractor, the GVI shall tag each part with the following:

- bus number and VIN
- claim number
- part number
- serial number (if available)

WR 2.7 Timeframe

Each claim must be submitted no more than thirty (30) days from the date of failure and/or repair, whichever is later. All defective parts must be returned to the Contractor, when requested, no more than forty-five (45) days from date of repair.

WR 2.8 Reimbursements

Reimbursements are to be transmitted to the following address.

The Honorable Valdemar O. Collins
Commissioner
2314 Kronprindsens Gade
Charlotte Amalie, U.S.V.I. 00802

SECTION 8: QUALITY ASSURANCE

QA 1. Contractor's In-Plant Quality Assurance Requirements

The Contractor, the Contractor's manufacturing plant and organization shall be certified to the appropriate QS-9000/ISO 9000 series of standards.

QA 1.1 Quality Assurance Organization

QA 1.1.1 Organization Establishment

The Contractor shall establish and maintain an effective in-plant quality assurance organization. It shall be a specifically defined organization and should be directly responsible to the Contractor's top management.

QA 1.1.2 Control

The quality assurance organization shall exercise quality control over all phases of production, from initiation of design through manufacture and preparation for delivery. The organization shall also control the quality of supplied articles.

QA 1.1.3 Authority and Responsibility

The quality assurance organization shall have the authority and responsibility for reliability, quality control, inspection planning, establishment of the quality control system, and acceptance/rejection of materials and manufactured articles in the production of the transit buses.

QA 1.2 Quality Assurance Organization Functions

QA 1.2.1 Minimum Functions

The quality assurance organization shall include the following minimum functions:

- **Work instructions:** The quality assurance organization shall verify inspection operation instructions to ascertain that the manufactured product meets all prescribed requirements.
- **Records maintenance:** The quality assurance organization shall maintain and use records and data essential to the effective operation of its program. These records and data shall be available for review by the resident inspectors. Inspection and test records for this procurement shall be available for a minimum of one year after inspections and tests are completed.
- **Corrective action:** The quality assurance organization shall detect and promptly ensure correction of any conditions that may result in the production of defective transit buses. These conditions may occur in designs, purchases, manufacture, tests or operations that culminate in defective supplies, services, facilities, technical data or standards.

QA 1.2.2 Basic Standards and Facilities

The following standards and facilities shall be basic in the quality assurance process:

- **Configuration control:** The Contractor shall maintain drawings, assembly procedures, and other documentation that completely describe a qualified bus that meets all of the options and special requirements of this procurement. The quality assurance organization shall verify that each transit bus is manufactured in accordance with these controlled drawings, procedures, and documentation.

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- **Measuring and testing facilities:** The Contractor shall provide and maintain the necessary gauges and other measuring and testing devices for use by the quality assurance organization to verify that the buses conform to all specification requirements. These devices shall be calibrated at established periods against certified measurement standards that have known, valid relationships to national standards.
- **Production tooling as media of inspection:** When production jigs, fixtures, tooling masters, templates, patterns, and other devices are used as media of inspection, they shall be proved for accuracy at formally established intervals and adjusted, replaced, or repaired as required to maintain quality.
- **Equipment use by resident inspectors:** The Contractor's gauges and other measuring and testing devices shall be made available for use by the resident inspectors to verify that the buses conform to all specification requirements. If necessary, the Contractor's personnel shall be made available to operate the devices and to verify their condition and accuracy.

QA 1.2.3 Maintenance of Control

The Contractor shall maintain quality control of purchases:

- **Supplier control:** The Contractor shall require that each Supplier maintains a quality control program for the services and supplies that it provides. The Contractor's quality assurance organization shall inspect and test materials provided by Suppliers for conformance to specification requirements. Materials that have been inspected, tested, and approved shall be identified as acceptable to the point of use in the manufacturing or assembly processes. Controls shall be established to prevent inadvertent use of nonconforming materials.
- **Purchasing data:** The Contractor shall verify that all applicable specification requirements are properly included or referenced in purchase orders of articles to be used on transit buses.

QA 1.2.4 Manufacturing Control

- **Controlled conditions:** The Contractor shall ensure that all basic production operations, as well as all other processing and fabricating, are performed under controlled conditions. Establishment of these controlled conditions shall be based on the documented Work instructions, adequate production equipment and special working environments if necessary.
- **Completed items:** A system for final inspection and test of completed transit buses shall be provided by the quality assurance organization. It shall measure the overall quality of each completed bus.
- **Nonconforming materials:** The quality assurance organization shall monitor the Contractor's system for controlling nonconforming materials. The system shall include procedures for identification, segregation and disposition.
- **Statistical techniques:** Statistical analysis, tests and other quality control procedures may be used when appropriate in the quality assurance processes.
- **Inspection status:** A system shall be maintained by the quality assurance organization for identifying the inspection status of components and completed transit buses. Identification may include cards, tags or other normal quality control devices.

QA 1.2.5 Inspection System

The quality assurance organization shall establish, maintain and periodically audit a fully documented inspection system. The system shall prescribe inspection and test of materials, Work in process and completed articles. As a minimum, it shall include the following controls:

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- **Inspection personnel:** Sufficient trained inspectors shall be used to ensure that all materials, components and assemblies are inspected for conformance with the qualified bus design.
- **Inspection records:** Acceptance, rework or rejection identification shall be attached to inspected articles. Articles that have been accepted as a result of approved materials review actions shall be identified. Articles that have been reworked to specified drawing configurations shall not require special identification. Articles rejected as unsuitable or scrap shall be plainly marked and controlled to prevent installation on the bus. Articles that become obsolete as a result of engineering changes or other actions shall be controlled to prevent unauthorized assembly or installation. Unusable articles shall be isolated and then scrapped. Discrepancies noted by the Contractor or resident inspectors during assembly shall be entered by the inspection personnel on a record that accompanies the major component, subassembly, assembly, or bus from start of assembly through final inspection. Actions shall be taken to correct discrepancies or deficiencies in the manufacturing processes, procedures or other conditions that cause articles to be in nonconformity with the requirements of the Contract specifications. The inspection personnel shall verify the corrective actions and mark the discrepancy record. If discrepancies cannot be corrected by replacing the nonconforming materials, then the GVI shall approve the modification, repair or method of correction to the extent that the Contract specifications are affected.
- **Quality assurance audits:** The quality assurance organization shall establish and maintain a quality control audit program. Records of this program shall be subject to review by the GVI.

QA 2. Inspection

QA 2.1 Inspection Stations

Inspection stations shall be at the best locations to provide for the Work content and characteristics to be inspected. Stations shall provide the facilities and equipment to inspect structural, electrical, hydraulic and other components and assemblies for compliance with the design requirements.

Stations shall also be at the best locations to inspect or test characteristics before they are concealed by subsequent fabrication or assembly operations. These locations shall minimally include underbody structure completion, body framing completion, body prior to paint preparation, water test, engine installation completion, underbody dress-up and completion, bus prior to final paint touchup, bus prior to road test and bus final road test completion.

QA 2.2 Resident Inspectors

QA 2.2.1 Resident Inspector's Role

The U.S. Virgin Islands GVI shall be represented at the Contractor's plant by resident inspectors, as required by FTA. Resident inspectors may be GVI employees or outside contractors. The GVI shall provide the identity of each inspector and shall also identify their level of authority in writing. They shall monitor, in the Contractor's plant, the manufacture of transit buses built under the procurement. The presence of these resident inspectors in the plant shall not relieve the Contractor of its responsibility to meet all of the requirements of this procurement. The GVI shall designate a primary resident inspector, whose duties and responsibilities are delineated in "Pre-Production Meetings," "Authority" and "Pre-Delivery Tests," below. Contractor and resident inspector relations shall be governed by the guidelines included as Attachment A to this "Section 8: Quality Assurance."

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QA 2.2.2 Pre-Production Meetings

The primary resident inspector may participate in design review and pre-production meetings with the GVI. At these meetings, the configuration of the buses and the manufacturing processes shall be finalized, and all Contract documentation provided to the inspector.

No less than thirty (30) days prior to the beginning of bus manufacture, the primary resident inspector may meet with the Contractor's quality assurance manager and may conduct a pre-production audit meeting. They shall review the inspection procedures and finalize inspection checklists. The resident inspectors may begin monitoring bus construction activities two weeks prior to the start of bus fabrication.

QA 2.2.3 Authority

Records and data maintained by the quality assurance organization shall be available for review by the resident inspectors. Inspection and test records for this procurement shall be available for a minimum of one year after inspections and tests are completed.

The Contractor's gauges and other measuring and testing devices shall be made available for use by the resident inspectors to verify that the buses conform to all specification requirements. If necessary, the Contractor's personnel shall be made available to operate the devices and to verify their condition and accuracy.

Discrepancies noted by the resident inspector during assembly shall be entered by the Contractor's inspection personnel on a record that accompanies the major component, subassembly, assembly or bus from start of assembly through final inspection. Actions shall be taken to correct discrepancies or deficiencies in the manufacturing processes, procedures or other conditions that cause articles to be in nonconformity with the requirements of the Contract specifications. The inspection personnel shall verify the corrective actions and mark the discrepancy record. If discrepancies cannot be corrected by replacing the nonconforming materials, the GVI shall approve the modification, repair or method of correction to the extent that the Contract specifications are affected.

The primary resident inspector shall remain in the Contractor's plant for the duration of bus assembly Work under this Contract. Only the primary resident inspector or designee shall be authorized to release the buses for delivery. The resident inspectors shall be authorized to approve the pre-delivery acceptance tests. Upon request to the quality assurance supervisors, the resident inspectors shall have access to the Contractor's quality assurance files related to this procurement. These files shall include drawings, assembly procedures, material standards, parts lists, inspection processing and reports, and records of Defects.

QA 2.2.4 Support Provisions

The Contractor shall provide office space for the resident inspectors in close proximity to the final assembly area. This office space shall be equipped with desks, outside and interplant telephones, Internet access, file cabinet and chairs.

QA 2.2.5 Compliance with Safety Requirements

At the time of the Pre-Production meeting, the Contractor shall provide all safety and other operational restrictions that govern the Contractor's facilities. These issues will be discussed and the parties will agree which rules/restrictions will govern the GVI inspector(s) and any other representatives during the course of the Contract.

QA 3. Acceptance Tests

QA 3.1 Responsibility

Fully documented tests shall be conducted on each production bus following manufacture to determine its acceptance to the GVI. These acceptance tests shall include pre-delivery inspections and testing by the Contractor and inspections and testing by the GVI after the buses have been delivered.

QA 3.2 Pre-Delivery Tests

The Contractor shall conduct acceptance tests at its plant on each bus following completion of manufacture and before delivery to the GVI. These pre-delivery tests shall include visual and measured inspections, as well as testing the total bus operation. The tests shall be conducted and documented in accordance with written test plans approved by the GVI.

Additional tests may be conducted at the Contractor's discretion to ensure that the completed buses have attained the required quality and have met the requirements in Section 6: Technical Specifications. The GVI may, prior to commencement of production, demand that the Contractor demonstrate compliance with any requirement in that section if there is evidence that prior tests have been invalidated by the Contractor's change of Supplier or change in manufacturing process. Such demonstration shall be by actual test, or by supplying a report of a previously performed test on similar or like components and configuration. Any additional testing shall be recorded on appropriate test forms provided by the Contractor and shall be conducted before acceptance of the bus.

The pre-delivery tests shall be scheduled and conducted with thirty (30) days notice so that they may be witnessed by the resident inspectors, who may accept or reject the results of the tests. The results of pre-delivery tests, and any other tests, shall be filed with the assembly inspection records for each bus. The underfloor equipment shall be available for inspection by the resident inspectors, using a pit or bus hoist provided by the Contractor. A hoist, scaffold or elevated platform shall be provided by the Contractor to easily and safely inspect bus roofs. Delivery of each bus shall require written authorization of the primary resident inspector. Authorization forms for the release of each bus for delivery shall be provided by the Contractor. An executed copy of the authorization shall accompany the delivery of each bus.

QA 3.2.1 Visual and Measured Inspections

Visual and measured inspections shall be conducted with the bus in a static condition. The purpose of the inspection testing includes verification of overall dimension and weight requirements, that required components are included and are ready for operation, and that components and subsystems designed to operate with the bus in a static condition do function as designed.

QA 3.2.2 Total Bus Operation

Total bus operation shall be evaluated during road tests. The purpose of the road tests is to observe and verify the operation of the bus as a system and to verify the functional operation of the subsystems that can be operated only while the bus is in motion.

Each bus shall be driven for a minimum of fifteen (15) miles during the road tests. If requested, computerized diagnostic printouts showing the performance of each bus shall be produced and provided to the GVI. Observed Defects shall be recorded on the test forms. The bus shall be retested when Defects are corrected and adjustments are made. This process shall continue until Defects or required adjustments are no longer detected.

QA 4. GVI-Specific Requirements

QA 4.1 Post-Delivery Tests

The GVI may conduct acceptance tests on each delivered bus. These tests shall be completed within 15 (fifteen) days after bus delivery and shall be conducted in accordance with written test plans. The purpose of these tests is to identify Defects that have become apparent between the time of bus release and delivery to the GVI. The post-delivery tests shall include visual inspection and bus operations. No post-delivery test shall apply criteria that are different from the criteria applied in an analogous pre-delivery test (if any). Verification of the speed in climbing the steep grades will be verified.

Buses that fail to pass the post-delivery tests are subject to non-acceptance. The GVI shall record details of all Defects on the appropriate test forms and shall notify the Contractor of acceptance, conditional acceptance, or non-acceptance of each bus within five days after completion of the tests. The Defects detected during these tests shall be repaired.

QA 4.2 Visual Inspection

The post-delivery inspection is similar to the inspection at the Contractor's plant and shall be conducted with the bus in a static condition. Any visual delivery damage shall be identified and recorded during the visual inspection of each bus.

QA 4.3 Bus Operation

Road tests will be used for total bus operation similar to those conducted at the Contractor's plant. Bus should be tested to simulate the steep grades that are in the Virgin Islands. In addition, the GVI may elect to perform chassis dynamometer tests. Operational deficiencies of each bus shall be identified and recorded.

Attachment A: New Bus Manufacturing Inspection Guidelines

This attachment was developed by the APTA Bus Equipment and Maintenance Committee and is intended as a guideline for use by transit systems (Agencies) and vehicle manufacturers (Contractors).

Two lists are included to reflect the expectations of both the transit system and the vehicle manufacturer.

Pre-Building Phase

Bus Manufacturer's Expectations	Transit System's Expectations
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<ol style="list-style-type: none"> 1. Contract/transit system inspectors must be given all Contract documentation before beginning the inspection process. 2. The bus manufacturer's inspection process should be reviewed at pre-production audit meeting. Inspectors should be present and understand the difference among various manufacturing processes. At least one key customer and manufacturer's representative who will follow the entire procurement from start to finish should be present. 3. When change orders are required, they need to be made as early in the process as possible. If change orders have an impact on the delivery schedule, consideration should be given to a delivery schedule revision. 4. Transit system inspection forms should be provided to manufacturers prior to the build so that the manufacturers will know what items the customer believes are critical. The inspection forms should be provided to the manufacturer after completion so that the Defects to be corrected can be identified. 5. If the transit system requires sole-source components, it should obtain assistance for the first installation of new components. 6. The transit system should have a decision maker at the pre-production audit meeting. 7. The transit system should make every effort to inform manufacturers of what they want. Hidden agenda items buried in the Contract to not promote the cooperative environment desired. 8. The parties should agree on what necessitates a line shutdown before the build begins. 	<ol style="list-style-type: none"> 1. Manufacturers should have a formal, approved quality assurance (QA) program and must adhere to the program. Any changes in the approved program must be resubmitted to the transit system for approval. 2. At the pre-production audit meeting with the transit system: <ul style="list-style-type: none"> • Representatives from contracts, engineering, quality and production should be represented. • Manufacturers should ensure good communication among their departments regarding Contract requirements. • A formal sales release must be ready for review at the meeting, and a final sales release must be ready before production. • Manufacturers should not use the meeting to sell parts. • Manufacturers should supply test information and other documents required to meet expectations. 3. Manufacturers should have application and installation approvals from Suppliers whenever possible. On installations of new major components, the sub-Supplier must be present at initial production. 4. Manufacturers should read and understand the specification prior to bid. Specification clarifications should be made during the approved equals process. Ask the appropriate questions at pre-bid meetings. 5. The manufacturer's service representative should be involved with the pre-production audit meeting and initial production, and/or at final acceptance. 6. Prior to build, the manufacturer should be able to provide the transit system a complete Bill of Materials for the buses to be built.
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Process During Building Phase

Bus Manufacturer's Expectations	Transit System's Expectations
<ol style="list-style-type: none"> 1. One person should be the primary inspector from start to finish. The primary inspector should be included in the design review process and pre-production meetings. The rotation of personnel with different expectations and standards causes difficulties. The first or second bus should stay at the manufacturer's location as a quality standard and be delivered last. 2. An adequate number of experienced inspectors should be available to prevent production line movement delays. 3. Inspectors should be available to support the manufacturing effort Monday through Friday, consistent with the manufacturer's production personnel hours. 4. Inspection should be conducted in a cooperative, professional manner. The inspector must <i>want</i> to solve problems. 5. Only one person should be able to make stop ship calls, and the reason for the stop ship <i>must</i> be immediately available. The stop ship should be in writing. 6. Problems identified should be brought to the attention of the manufacturer at the stage when they occur rather than at a future stage or when the vehicle is complete. 	<ol style="list-style-type: none"> 1. The resident inspector should have access to a complete set of engineering drawings and documents for the bus being built. Engineering or manufacturing changes must be formally documented and included in documents provided to transit systems. 2. Manufacturers should maintain the build schedule if possible. Changes in the build schedule and requests for overtime and weekend Work must be communicated as early as possible. 3. Buses that are not ready or complete should not be presented for final inspection. 4. Manufacturers should have a formal internal/external communications process and feedback for inspection problems and resolutions. Manufacturers should provide early resolution of problems identified by inspectors. QA procedures must be revised to reflect problem corrections. 5. The attitude of manufacturers and QA personnel is important; remember who the customer is. However, there must be mutual respect. 6. The transit system is not responsible for redesigning the bus, correcting problems or providing manufacturing quality. It audits only. Manufacturers should not need a learning period to determine acceptable quality standards. 7. Buses should be identical and interchangeable within an order unless provided by the transit system. 8. Inspection Work should be spread evenly during the workday to the extent possible.

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Post-Building Phase

Bus Manufacturer's Expectations	Transit System's Expectations
<ol style="list-style-type: none">1. To ensure prompt payment, the transit system should increase the rate of the final acceptance process.2. The on-property final acceptance inspection should be primarily for shipping damage and Defects that occur during shipment. It should not be a complete vehicle inspection with criteria different from those used at the plant.	<ol style="list-style-type: none">1. Defects noted at the property final inspection should be repaired in a timely and acceptable manner.

SECTION 9: FORMS AND CERTIFICATIONS

CER 1. Proposer's Checklist

RFP

Package 1: Technical Proposal

- ☐ 1. Letter of Transmittal
- ☐ 2. Technical Proposal
- ☐ 3. Acknowledgement of Addenda
- ☐ 4. Form for Proposal Deviation
- ☐ 5. Vehicle Questionnaire
- ☐ 6. References and non-priced information (if provided by Proposer)
- ☐ 7. Engineering organization chart, engineering change control procedure, field modification process
- ☐ 8. Manufacturing facility plant layout, other contracts, staffing
- ☐ 9. Production schedule and other Contract commitments for the duration of this Contract.
- ☐ 10. Quality Assurance Program

Package 2: Price Proposal (must be submitted in a **separate** sealed envelope)

- ☐ 1. Letter of Transmittal
- ☐ 2. Pricing Schedule (including option buses, spare parts package, engineering, manuals, training, special tools and test equipment)

Package 3: Qualifications Package

- ☐ 1. Pre-Award Evaluation Data Form
- ☐ 2. A copy of the three (3) most recent audited financial statements or a statement from the Proposer regarding how financial information may be reviewed by the GVI
- ☐ 3. Letter for insurance
- ☐ 4. Letter for performance bond (if applicable)
- ☐ 5. Letter of commitment for parental financial guarantee (if applicable)
- ☐ 6. Proposal Form

Package 4: Proprietary/Confidential Information Package¹

- ☐ 1. Proprietary/Confidential Information

1. There may be items in the first three packages that are included in Package 4 because they are considered to be proprietary/confidential information. When this occurs, the Proposer must note that fact in Packages 1 through 3.

CER 2. Request for Pre-Offer Change or Approved Equal

This form must be used for requested clarifications, changes, substitutes or approval of items equal to items specified with a brand name and must be submitted as far in advance of the Due Date, as specified in “Questions, Clarifications and Omissions.”

Virgin Islands Department of Public Works
[Insert RFP number and title]

Request #: Proposer: RFP Section: Page:	
Questions/clarification or approved equal:]	
GVI action:	<input type="checkbox"/> Approved <input type="checkbox"/> Denied <input type="checkbox"/> See addendum <input type="checkbox"/> See response below
GVI response:	

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CER 3. Acknowledgement of Addenda

Failure to acknowledge receipt of all addenda may cause the Proposal to be considered nonresponsive to the Solicitation. Acknowledged receipt of each addendum must be clearly established and included with the Proposal.

The undersigned acknowledges receipt of the following addenda to the documents:

Addendum No.: Dated:

Addendum No.: Dated:

Addendum No.: Dated:

Addendum No.: Dated:

Proposer:

Name:

Title:

Phone:

Street address:

City, state, ZIP:

Authorized signature

Date

CER 4. Contractor Service and Parts Support Data

Location of nearest Technical Service Representative to GVI

Name:

Address:

Telephone:

Describe technical services readily available from said representative:

Location of nearest Parts Distribution Center to GVI:

Name:

Address:

Telephone:

Describe the extent of parts available at said center:

Policy for delivery of parts and components to be purchased for service and maintenance:

Regular method of shipment:

Cost to GVI:

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CER 6. Pricing Schedule

Virgin Islands Department of Public Works
 [Insert RFP number and title]

	All prices are to be in United States dollars	
	Unit Price	Extension
Ten Heavy Duty Fixed Route Buses		
Manuals	Lump Sum	
Training	Lump Sum	
Spare parts package		
Test equipment and special tools		
Extended Warranty [GVI to identify subsystem]		
Extended Warranty [GVI to identify subsystem]		
Extended Warranty [GVI to identify subsystem]		
Extended Warranty [GVI to identify subsystem]		
Other [GVI to specify]		
Sales tax (if applicable)		
Delivery charges		
TOTAL PROPOSED PRICE		
ADA equipment (included in above unit prices)		

This form is to be completed and included in the Price Package.

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CER 7. Pre-Award Evaluation Data Form

NOTE: This form is to be completed and included in the Qualification Package. Attach additional pages if required.

Virgin Islands Department of Public Works

[Insert RFP number and title]

<p>1. Name of firm:</p> <p>2. Address:</p> <p>3. <input type="checkbox"/> Individual <input type="checkbox"/> Partnership <input type="checkbox"/> Corporation <input type="checkbox"/> Joint Venture</p> <p>4. Date organized: State in which incorporated:</p> <p>5. Names of officers or partners:</p> <p>a. b. c. d. e.</p> <p>6. How long has your firm been in business under its present name?</p>
<p>7. Attach as SCHEDULE ONE a list of similar current contracts that demonstrates your available capacity, including the quantity and type of bus, name of contracting party, percentage completed and expected completion date.</p> <p>8. Attach as SCHEDULE TWO a list of at least three similar contracts that demonstrates your technical proficiency, each with the name of the contracting party and number and they type of buses completed within the last five years.</p> <p>9. Have you been terminated or defaulted, in the past five years, on any Contract you were awarded? <input type="checkbox"/> Yes <input type="checkbox"/> No If yes, then attach as SCHEDULE THREE the full particulars regarding each occurrence.</p> <p>10. Attach as SCHEDULE FOUR Proposer's last three (3) financial statements prepared in accordance with generally accepted accounting principles of the jurisdiction in which the Proposer is located, and audited by an independent certified public accountant; or a statement from the Proposer regarding how financial information may be reviewed by the GVI [This may require execution of an acceptable non-disclosure agreement between the GVI and the Proposer.]</p> <p>11. Attach as SCHEDULE FIVE a list of all principal Subcontractors and the percentage and character of Work (Contract amount) that each will perform on this Contract.</p> <p>12. If the Contractor or Subcontractor is a joint venture, submit PRE-AWARD EVALUATION DATA forms for each member of the joint venture.</p>
<p>The above information is confidential and will not be divulged to any unauthorized personnel.</p>
<p>The undersigned certifies to the accuracy of all information: Name and title: Company:</p>

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Authorized signature

Date

CER 8. Federal Certifications

CER 8.1 Buy America Certification

This form is to be submitted with an offer exceeding the small purchase threshold for federal assistance programs, currently set at \$100,000.

Certificate of Compliance

The Proposer hereby certifies that it will comply with the requirements of 49 USC Section 5323(j)(2)(C), Section 165(b)(3) of the Surface Transportation Assistance Act of 1982, as amended, and the regulations of 49 CFR 661.11:

Name and title:

Company:

Authorized signature

Date

Certificate of Non-Compliance

The Proposer hereby certifies that it cannot comply with the requirements of 49 USC Section 5323(j)(2)(C) and Section 165(b)(3) of the Surface Transportation Assistance Act of 1982, as amended, but may qualify for an exception to the requirements consistent with 49 USC Sections 5323(j)(2)(B) or (j)(2)(D), Sections 165(b)(2) or (b)(4) of the Surface Transportation Assistance Act, as amended, and regulations in 49 CFR 661.7.

Name and title:

Company:

Authorized signature

Date

CER 8.2 Debarment and Suspension Certification for Prospective Contractor

Primary covered transactions must be completed by proposer for contract value over \$25,000.

Choose one alternative:

- ☐ The Proposer, [insert name], certifies to the best of its knowledge and belief that it and its principals:
1. Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any federal department or agency;
 2. Have not within a three-year period preceding this Proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (federal, state or local) transaction or Contract under a public transaction; violation of federal or state antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;
 3. Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (federal, state, or local) with commission of any of the offenses enumerated in Paragraph 2 of this certification; and
 4. Have not within a three-year period preceding this Proposal had one or more public transactions (federal, state or local) terminated for cause or default.

OR

- ☐ The Proposer is unable to certify to all of the statements in this certification, and attaches its explanation to this certification. (In explanation, certify to those statements that can be certified to and explain those that cannot.)

The Proposer certifies or affirms the truthfulness and accuracy of the contents of the statements submitted on or with this certification and understands that the provisions of Title 31 USC § Sections 3801 are applicable thereto.

Executed in [insert city and state].

Name:

Authorized signature

Date

CER 8.3 Debarment and Suspension Certification (Lower-Tier Covered Transaction)

This form is to be submitted by each Subcontractor receiving an amount exceeding \$25,000.

The prospective lower-tier participant (Proposer) certifies, by submission of this Proposal, that neither it nor its "principals" as defined at 49 CFR § 29.105(p) is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or Agency.

If the prospective Proposer is unable to certify to the statement above, it shall attach an explanation, and indicate that it has done so by placing an "X" in the following space: _____

THE PROPOSER, _____, CERTIFIES OR AFFIRMS THE TRUTHFULNESS AND ACCURACY OF EACH STATEMENT OF ITS CERTIFICATION AND EXPLANATION, IF ANY. IN ADDITION, THE PROPOSER UNDERSTANDS AND AGREES THAT THE PROVISIONS OF 31 USC §§ 3801 *ET SEQ.* APPLY TO THIS CERTIFICATION AND EXPLANATION, IF ANY.

Name and title of the proposer's authorized official:

Authorized signature

Date

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CER 8.4 Non-Collusion Affidavit

This affidavit is to be filled out and executed by the Proposer; if a corporation makes the bid, then by its properly executed agent. The name of the individual swearing to the affidavit should appear on the line marked "Name of Affiant." The affiant's capacity, when a partner or officer of a corporation, should be inserted on the line marked "Capacity." The representative of the Proposer should sign his or her individual name at the end, not a partnership or corporation name, and swear to this affidavit before a notary public, who must attach his or her seal.

State of _____, County of _____	
I, _____, being first duly sworn, do hereby state that (Name of Affiant)	
I am _____ of _____ (Capacity)	(Name of Firm, Partnership or Corporation)
whose business is _____	
and who resides at _____	
and that _____ (Give names of all persons, firms, or corporations interested in the bid)	
is/are the only person(s) with me in the profits of the herein contained Contract; that the Contract is made without any connection or interest in the profits thereof with any persons making any bid or Proposal for said Work; that the said Contract is on my part, in all respects, fair and without collusion or fraud, and also that no members of the Board of Trustees, head of any department or bureau, or employee therein, or any employee of the Authority, is directly or indirectly interested therein.	
_____ Signature of Affiant	_____ Date
Sworn to before me this _____ day of _____, 20____.	
_____ Notary public	_____ My commission expires
Seal	

CER 8.5 Lobbying Certification

This form is to be submitted with an offer exceeding \$100,000.

The Proposer certifies, to the best its knowledge and belief, that:

1. No federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of a federal department or agency, a member of the U.S. Congress, an officer or employee of the U.S. Congress, or an employee of a member of the U.S. Congress in connection with the awarding of any federal Contract, the making of any federal grant, the making of any federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment or modification thereof.
2. If any funds other than federal appropriated funds have been paid or will be paid to any person for making lobbying contacts to an officer or employee of any agency, a member of Congress, an officer or employee of Congress, or an employee of a member of Congress in connection with this federal Contract, grant, loan or cooperative agreement, the undersigned shall complete and submit Standard Form LLL, "Disclosure Form to Report Lobbying," in accordance with its instruction, as amended by "Government-wide Guidance for New Restrictions on Lobbying," 61 Fed. Reg. 1413 (1/19/96).
3. The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants and contracts under grants, loans and cooperative agreements) and that all subrecipients shall certify and disclose accordingly. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31, USC § 1352 (as amended by the Lobbying Disclosure Act of 1995). Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

THE PROPOSER, _____, CERTIFIES OR AFFIRMS THE TRUTHFULNESS AND ACCURACY OF EACH STATEMENT OF ITS CERTIFICATION AND DISCLOSURE, IF ANY. IN ADDITION, THE PROPOSER UNDERSTANDS AND AGREES THAT THE PROVISIONS OF 31 USC §§ 3801 ET SEQ. APPLY TO THIS CERTIFICATION AND DISCLOSURE, IF ANY.

Name of the bidder or Proposer's authorized official:

Title:

Signature

Date

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Per paragraph 2 of the included form Lobbying Certification, add Standard Form–LLL, “Disclosure Form to Report Lobbying,” if applicable.

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CER 8.6 Certificate of Compliance with Bus Testing Requirement

The undersigned certifies that the vehicle offered in this procurement complies and will, when delivered, comply with 49 USC § 5323(c) and FTA's implementing regulation at 49 CFR Part 665 according to the indicated one of the following three alternatives.

Mark one and only one of the three blank spaces with an "X."

1. ____ The buses offered herewith have been tested in accordance with 49 CFR Part 665 on _____ (date). If multiple buses are being proposed, provide additional bus testing information below or on attached sheet. The vehicles being sold should have the identical configuration and major components as the vehicle in the test report, which must be submitted with this Proposal. If the configuration or components are not identical, then the manufacturer shall provide with its Proposal a description of the change and the manufacturer's basis for concluding that it is not a major change requiring additional testing. If multiple buses are being proposed, testing data on additional buses shall be listed on the bottom of this page.
2. ____ The manufacturer represents that the vehicle is "grandfathered" (has been used in mass transit service in the United States before October 1, 1988, and is currently being produced without a major change in configuration or components), and submits with this Proposal the name and address of the recipient of such a vehicle and the details of that vehicle's configuration and major components.
3. ____ The vehicle is a new model and will be tested and the results will be submitted to the GVI prior to acceptance of the first bus.

The undersigned understands that misrepresenting the testing status of a vehicle acquired with federal financial assistance may subject the undersigned to civil penalties as outlined in the DOT's regulation on Program Fraud Civil Remedies, 49 CFR Part 31. In addition, the undersigned understands that FTA may suspend or debar a manufacturer under the procedures in 49 CFR Part 29.

Company name:

Name and title of the proposer's authorized official:

Authorized signature

Date

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CER 8.7 DBE Approval Certification

I hereby certify that the Proposer has complied with the requirements of 49 CFR 26, Participation by Disadvantaged Business Enterprises in DOT Programs, and that its goals have not been disapproved by the Federal Transit Administration.

Name and title of the proposer's authorized official:

Authorized signature

Date

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CER 8.8 Federal Motor Vehicle Safety Standards

The Proposer and (if selected) Contractor shall submit (1) manufacturer's FMVSS self-certification sticker information that the vehicle complies with relevant FMVSS or (2) manufacturer's certified statement that the contracted buses will not be subject to FMVSS regulations.

Company name: _____

Name of signer: _____

Title: _____

Authorized signature

Date

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CER 9. Other Certifications

CER 9.1 Proposal Form

Proposer shall complete the following form and include it in the price Proposal.

PROPOSAL

By execution below by a duly authorized representative(s) of the Proposer, the Proposer hereby offers to furnish equipment and services as specified in its Proposal submitted to The Department of Property and Procurement, Government of the United States Virgin Islands in response to Request for Proposal No.

_____ in its entirety.

Proposer: _____

Street address: _____

City, state, ZIP: _____

Name and title of Authorized Signer(s): _____

Name and title of Authorized Signer(s): _____

Phone: _____

_____	_____
Authorized signature	Date

_____	_____
Authorized signature	Date

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CER 9.2 Notice of Award

NOTE: This form is included as an example. Standard industry practice is to execute a separate Contract as provided as an example in Appendix E.

By execution below, Government of the United States Virgin Islands accepts Proposal as indicated above.

Contracting officer: _____

Authorized signature

Date

CER 10. Vehicle Questionnaire

This form must be completed and included in the Technical Proposal.

GENERAL BUS DATA SHEET: 29-FOOT TO 32-FOOT HEAVY-DUTY BUS

Bus Manufacturer:

Bus Model Number:

Basic Body Construction Type:

General Dimensions

Overall Length	Over bumpers	<input type="text"/>	feet	<input type="text"/>	inches
	Over body	<input type="text"/>	feet	<input type="text"/>	inches
Overall Width	Over body excluding mirrors and lights	<input type="text"/>	feet	<input type="text"/>	inches
	Over body including mirrors	<input type="text"/>	feet	<input type="text"/>	inches
	Over tires	<input type="text"/>	feet	<input type="text"/>	inches
Overall Height (maximum)		<input type="text"/>	feet	<input type="text"/>	inches

Angle Of Approach degrees

Angle Of Departure degrees

Breakover Angle degrees

Doorway Clear Opening (at widest point) inches

	Width with grab handles	Width without grab handles	Height
Front Door	<input type="text"/> inches	<input type="text"/> inches	<input type="text"/> inches
Rear Door	<input type="text"/> inches	<input type="text"/> inches	<input type="text"/> inches

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Front axle floor height above ground (centerline of bus)

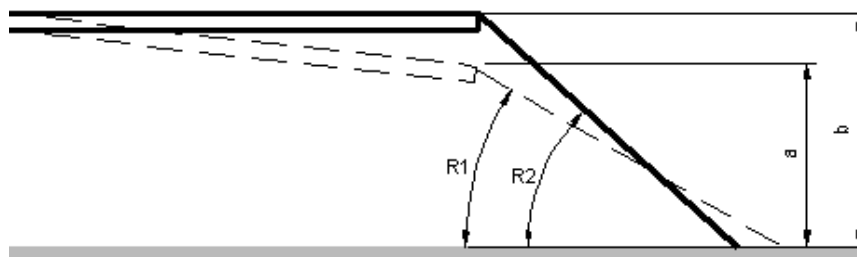
	inches
--	--------

Rear axle floor height above ground (centerline of bus)

	inches
--	--------

Step height from ground (measured at center of doorway)

	inches
--	--------



	Front doorway	Ramp angle	Rear doorway
Kneeled	<input type="text"/> inches (a)	<input type="text"/> degrees (R1)	<input type="text"/> inches (a)
Unkneeled	<input type="text"/> inches (b)	<input type="text"/> degrees (R2)	<input type="text"/> inches (b)

Interior Head Room (floor to ceiling at center of aisle)

First axle location

	inches
--	--------

Rear axle location

	inches
--	--------

Rear settee (in front of seat)

	inches
--	--------

Aisle Width

Minimum width on floor between first axle wheel housings

	inches
--	--------

Minimum width on floor between rear axle wheel housings

	inches
--	--------

Minimum Ground Clearance

Outside axles zones

	inches
--	--------

Inside axles zones

	inches
--	--------

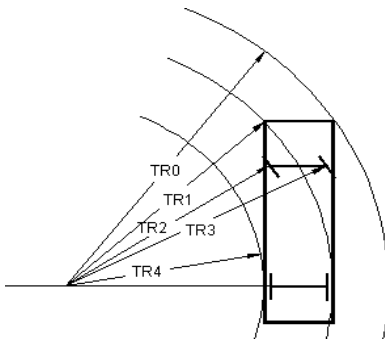
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Horizontal Turning Envelope (see diagram below)

Outside body turning radius, TR0 (including bumper)

	feet		inches
	feet		inches

Inside Body Turning Radius innermost point, TR4 (including bumper)



Wheelbase inches

Overhang, Centerline Of Axle Over Bumper

Front inches

Rear inches

Floor

Maximum interior floor slope (from horizontal) degrees

Capacity

Total number of passenger seats

Passenger seating manufacturer/model number

Total number of standing passengers (1 per 1.5 sq. ft.)

Minimum hip to knee space

Maximum hip to knee space

Restraint system type and model number

<input type="text"/>	
<input type="text"/>	
<input type="text"/>	
<input type="text"/>	inches
<input type="text"/>	inches
<input type="text"/>	

Bus Weight

	Curb Weight		Curb Weight plus Gross Load*		GVWR
First axle	<input type="text"/> lbs		<input type="text"/> lbs		<input type="text"/> lbs
Rear axle	<input type="text"/> lbs		<input type="text"/> lbs		<input type="text"/> lbs

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Total lbs lbs lbs

* Including operator, seated passengers and standees at 150 lbs per person

Steering Axle

Manufacturer

Type and weight
rating

Model number

Drive Axle

Manufacturer

Type and weight
rating

Model number

Drive Axle Ratio

Differential ratio

Hub reduction ratio (if used)

Final axle ratio (if hub reduction is
used)

Brake System

Make/type of fundamental system

First axle brake chamber model

Rear axle brake chamber model

First axle slack adjuster

Manufacturer

Model number

Rear axle slack adjuster

Manufacturer

Model number

First axle brake drum/rotor

Manufacturer

Rear axle brake drum/rotor

Manufacturer

--

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Air Compressor

Manufacturer		
Type		
Model number		
Rated capacity		cfm
Capacity at idle		cfm
Maximum warranted speed		rpm
Idle speed		rpm
Drive type		
Governor cut-in pressure		psi
Governor cut-out pressure		psi

Air Reservoir Capacity

Manufacturer			
Supply reservoir number and size		/	cubic inches total
Primary reservoir number and size		/	cubic inches total
Secondary reservoir number and size		/	cubic inches total
Parking reservoir number and size		/	cubic inches total
Accessory reservoir number and size		/	cubic inches total
Other reservoir number and size		/	cubic inches total

Cooling System

	Radiator	Charge air cooler
Manufacturer		
Type		
Model number		
Number of tubes		
Fins per inch		
Fin thickness (inches)		
Fin construction		

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Total cooling system capacity (gallons)	<input type="text"/>	gallons
Radiator fan manufacturer	<input type="text"/>	
Fan speed/control type (mech/elect/hyb)	<input type="text"/>	
Surge tank capacity	<input type="text"/>	gallons
Surge tank material	<input type="text"/>	
Overheat alarm temperature	<input type="text"/>	degrees F
Shutdown temperature settings	<input type="text"/>	degrees F

Electrical

Primary Interior Lighting System

Manufacturer	<input type="text"/>
Type	<input type="text"/>
Model number	<input type="text"/>

Alternator

Manufacturer	<input type="text"/>	
Type	<input type="text"/>	
Model number	<input type="text"/>	
Output at idle	<input type="text"/>	amps

Voltage Regulator

Manufacturer	<input type="text"/>
Model number	<input type="text"/>

Voltage Equalizer

Manufacturer	<input type="text"/>
Model number	<input type="text"/>

Starter Motor

Manufacturer	<input type="text"/>
Voltage	<input type="text"/>
Model number	<input type="text"/>

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Energy Storage

Batteries – low voltage

Manufacturer

Type

Model number

Cold cranking
amps

Engine

Manufacturer

Model number/version

Horsepower/torque
rating

Engine Brake(s)

Type

Model

Bumpers

Manufacturer

Type

Fuel and Exhaust System

Fuel type

Operating range and route
profile

Fuel Tank

Manufacturer

Capacity (total and usable)

Construction material

Quantity and location of tanks

	Gallons	/	Gallons

Exhaust System

Diesel particulate filter
manufacturer

--

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Describe DPF electronic interface

Muffler manufacturer (if applicable)

Air Suspension

Air spring manufacturer

Air spring quantity per axle

Shock absorber manufacturer

Shock absorber quantity per axle

Front	Middle	Rear

Steering

Pump manufacturer

Pump model number

Steering gear manufacturer

Steering gear model number

Steering gear type

Steering wheel diameter

Maximum effort at steering wheel*

	inches

* Unloaded stationary coach on dry asphalt pavement

Transmission

Manufacturer

Type

Model number

Number of forward speeds

Retarder

Type

Model number

Propshaft

Manufacturer

--

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Wheels

Manufacturer	
Type	
Size	
Mounting type	
Bolt circle diameter	
Protective coating	

Tires

Manufacturer	
Type	
Size	
Load range/air pressure	

Door System

Door panels	Manufacturer	Type
Front door		
Rear door		

Actuating Mechanism (air, electric, spring, other)

Manufacturer	
Front door	
Rear door	

Heating and Ventilating Equipment

Heating system capacity		Btu
Air conditioning system capacity		Btu
Ventilating capacity		CFM per passenger
Manufacturer and model		
Refrigerant type		

Driver's Heater

Manufacturer	
--------------	--

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Type	
Model number	
Capacity	

Passenger Loading System

Manufacturer	
Type (hydraulic, electric or both)	
Model number	
Capacity (lbs.)	

Dimensions

Width of ramp		inches
Length of ramp		inches

Cycle Times

Normal Idle

Stowed to ground		seconds
Ground to stow		seconds

Fast Idle

		seconds
		seconds

Electronics

Video system manufacturer	
Video system model number	
Number of cameras	
Multiplex system manufacturer	
Multiplex system model number	
Destination sign manufacturer	
Destination sign model number	
Passenger information system manufacturer	
Passenger information system model number	

Coach Body Fittings

Passenger windows manufacturer	
--------------------------------	--

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Exterior/Interior Mirrors

Size

Manufacturer

Model number

Manufacturer part numbers

Bicycle Racks

Manufacturer

Model number

Paint System

Manufacturer

Type

Operator Control Layout Diagram:

--

SECTION 10: CONTRACT

[RESERVED]